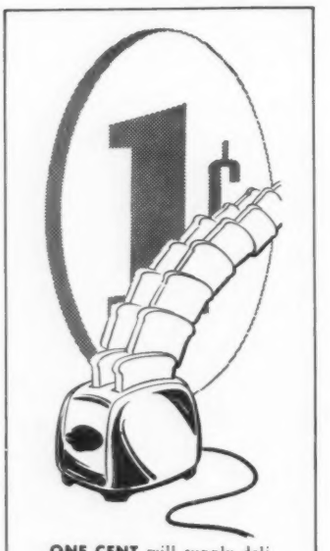
ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS

McGRAW-HILL CO. OF CALIFORNIA

MAY, 1941

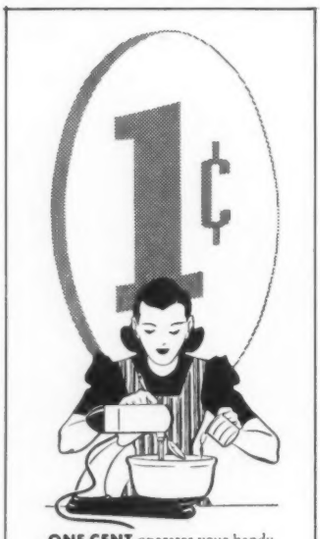
25c a Copy



ONE CENT will supply delicious, perfectly browned toast for the average family for approximately three days at Edison's low domestic electric rates. You get more for your money electrically. Edison rates are among the lowest in the nation.

Your Electrical penny buys more

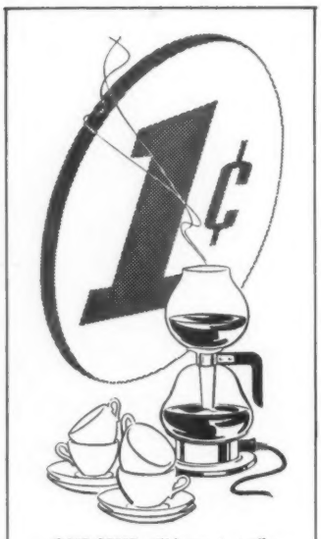
Edison



ONE CENT operates your handy electric mixer for approximately a week of normal usage at Edison's low domestic electric rates. Save time and labor with modern electrical appliances—the more they are used, the less the additional electricity costs. Edison rates are among the lowest in the nation.

It Costs Less to Live Electrically

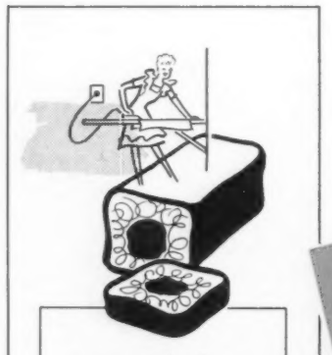
Edison



ONE CENT will brew the coffee for an average family for three mornings with an electric coffeemaker at Edison's low domestic electric rates. Modern electrical appliances save time, trouble and money. Edison rates are among the lowest in the nation.

Electricity—your biggest bargain

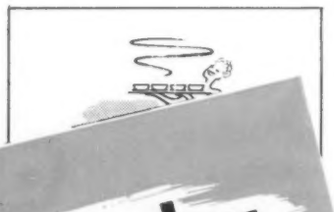
Edison



a candy bar

costs more than the electricity *to do the family ironing for one week with an electric iron on Edison's low domestic electric rates*

ELECTRICITY GIVES YOU MORE FOR YOUR MONEY Edison



a 1¢ sale every day

Edison advertising sells modern electrical appliances in terms of economy of operation. It builds good prospects for electrical dealers by showing consumers that it actually costs less to live the easy, time and labor saving electrical way.

ARE AMONG THE LOWEST IN THE NATION Edison

SOUTHERN CALIFORNIA Edison

5-41

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What Do YOU Look for in a Street-lighting Luminaire?

PROPER LIGHT DISTRIBUTION?

You have it, without disturbing glare, when you use the Forms 79S, 79D, and 79R—because their deep-shading reflector delivers more illumination on the pavement than the best of previous luminaires. The Form 79S gives a symmetrical distribution; aluminum deflectors within the globe of 79D's redirect a large portion of the house-side light on the roadway. But, if you want highest efficiency, use 79R's with the Holophane refractor globe—they're unequalled.

LOW INITIAL COST?

For the money you would pay for an ordinary luminaire you can obtain a Form 79 with spun-sealed glassware, weatherproof joint between hood and reflector, lamp-saver reflector, and seven other "plus" features. Production-line manufacturing, made possible by the widespread demand for this luminaire—installations have been made in all 48 states—means more for your street-lighting dollar.

SUSTAINED EFFICIENCY?

General Electric's Form 79, you can be sure, will maintain its original efficiency. There will be no collection of insects and dirt within the globe to trap a large part of the light. Because the only joint in the luminaire is between the hood and reflector where an accurate die casting fits against a die-formed shoulder, users report that reflectors inspected after years of service have been found absolutely clean.

EASY SERVICING?

Release the tension on two snap-action latches, lift them off the hood lugs, let the reflector hang by the safety chain—in less time than it takes to unbutton your coat the lineman has opened the luminaire for servicing. Relamping, replacing broken glassware, cleaning—all can be done easily on the job.

ATTRACTIVE APPEARANCE?

Smooth flowing lines, the absence of gingerbread on the hood, liberal use of die-cast and punch-press parts—all share in making Form 79's clean-cut and attractive. Many prefer the natural-aluminum finish of both reflector and hood. Others use our standard—a glossy, dark-green, Glyptal-enamel finish. Where the effect of a much larger luminaire is desired, the longer No. 207 globe is available at no additional cost.

MINIMUM MAINTENANCE EXPENSE?

More than six years ago when glassware breakage was a regular occurrence, General Electric introduced the Form 79 with spun-sealed globe and said—"glassware replacement will be about 10 cents a year." Apparently we were too conservative; one utility reports only 4.63 cents per luminaire a year, another has 134 Form 79's and recently asked for information on one replacement globe—*their first breakage in three years*. These low records were made possible by spinning the reflector to the globe to protect the edge against chipping and damage. And the stepped reflector—the lamp-saving feature that redirects radiant energy slightly to one side of the lamp stem—has a share in keeping maintenance low.

You want a luminaire that meets today's most exacting demands for complete reliability, sustained economy, and effective illumination. Citizens in your community want safer, better-lighted streets. That is why more and more electric service companies and cities all across the country are buying Form 79's. Can we help you? General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

452-13-3010

Here in the WEST

People

A. D. Cameron

Although not an author in fact, advent of the second Pacific regional conference of the Illuminating Engineering Society, (p. 41-2) of which he is national president makes him in a sense author of that successful conference. Besides being vice president of Holophane, and 30 years in the lighting profession, Cameron served with the AEF, became a major, and now has offered the expert services of IES to the government.

Cameron told the regional conference the part to be played by the illuminating engineer in national defense. The conference brought also the IES appointee to the Civil Protection Commission of the War Department, Sam Hibben, of Westinghouse.

Erb and Applegate

R. F. Erb is assistant engineer, L. M. Applegate associate engineer, of the distribution operations section of Bonneville Power Administration, where series capacitance (p. 34) calculations on long rural lines require a special technique. Erb, a Montana State graduate, was with the U. S. Army Engineers at Fort Peck. Applegate a U. of Washington man with a graduate degree from California Institute of Technology has been at Bonneville since 1938.

W. H. Dudley

has been in the West for Frigidaire since 1930, coming here from St. Louis to become district representative at the Oakland district. In 1932 he was transferred to Los Angeles as sales manager and has been household sales manager since then. A dramatic speaker, Dudley was selected to give the range story to the dealer meetings throughout southern and central California on the Popularity campaign. What he told audiences is to be found on p. 43.

Pages

In Union There Is Strength 31
By KINSEY M. ROBINSON—straight talk by the Washington Water Power president about the power situation in the Northwest

Figuring for Series Capacitance 34
By R. F. ERB and L. M. APPLEGATE—Long rural and distribution lines from Bonneville call for capacitance calculations

Infra-red Fire and Explosion Hazard 43
By J. O. CASE—Los Angeles industrial electrical contractor tests and finds them to be not worth worrying about

Why Sell Electric Ranges? 48
By W. H. DUDLEY—The dynamic talk given by this Frigidaire sales manager before the dealer meetings of the Popularity campaign

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Cover photograph by Bill Saunders illustrates the passing of the windmill with the advent of the more reliable electricity, to the farm

Preview

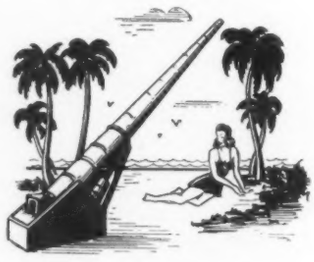
Convention-in-Print

Annually now for more years than most people like to admit as age, ELECTRICAL WEST has brought a full programmed convention-in-print to those who for any reason cannot attend the industry conventions. For some depression years it carried the only convention there was—on paper.

Real benefit comes from the industry convention, ELECTRICAL WEST has seen and believed. Busy men and women pool their methods, experiences, ideas and ideals to enrich all who wish to dip from that pool.

PCEA will hold its annual convention where the indolent tropical beach still holds out against bristling defense preparations, at Coronado. The June issue will report that meeting in full.

Northwest Electric Light & Power Assn. has held its various Section conferences, the papers of which will appear in June.



These will include its engineering, commercial and sales and home service committee reports.

Since defense is the all-out subject of the day and its requirements are causing such severe adjustments, the headlined "speakers" on the convention-in-print program will seek to clarify and guide confused businessmen in these peculiar times.

Roasters

begin to appeal with the advent of warmer weather and the call of the out-of-doors. The Sales Guide for June

will refreshen jaded sales appeals with ideas for the still further popularization of these handy appliances. Electric clocks, too, will be dusted off for revived opportunities.

Instinctive-like, I duck behind my Safety Factors book in self protection

"...if this is Hay, I'll EAT it!"

I was visiting a paper mill, just to renew cold acquaintances (my competitors already bein' in there solid), when whambo, I get this:

"Look at these embossing roller bearings — burned out again! That's what we get for listening to a lubrication specialist! 'Specialists!'— that's a lotta hay!"

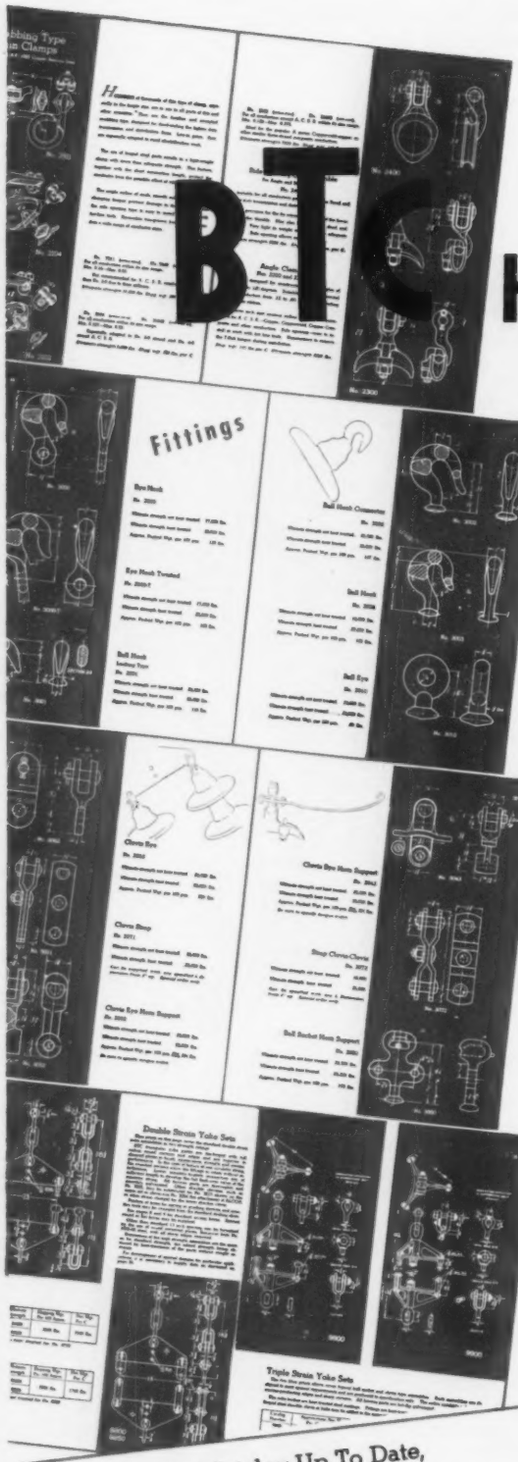
Instinctive-like, I duck behind my Safety Factors book in self protection. And what d'you suppose happens then?

If that doggone engineer don't grab my book right outta my hands... and start readin' about SAFETY FACTOR NUMBER TWO.

Well, I'm gettin' his business *now* — and his bearing troubles are over. It's wonderful what Shell's Safety Factors will do — and that ain't hay.

Your Shell Salesman

P. S. When I SHOW YOU my book, you can see for yourself how Shell's Safety Factors can help you reduce wear, or increase power offtake, or control friction or combustion heat, or save on shutdown losses, or save on your outlay for lubricants.



B.T.C. HANDLES ANOTHER SPECIAL JOB

. . . YOUR HI-LINE CATALOG BY UNIFORMED MESSENGER

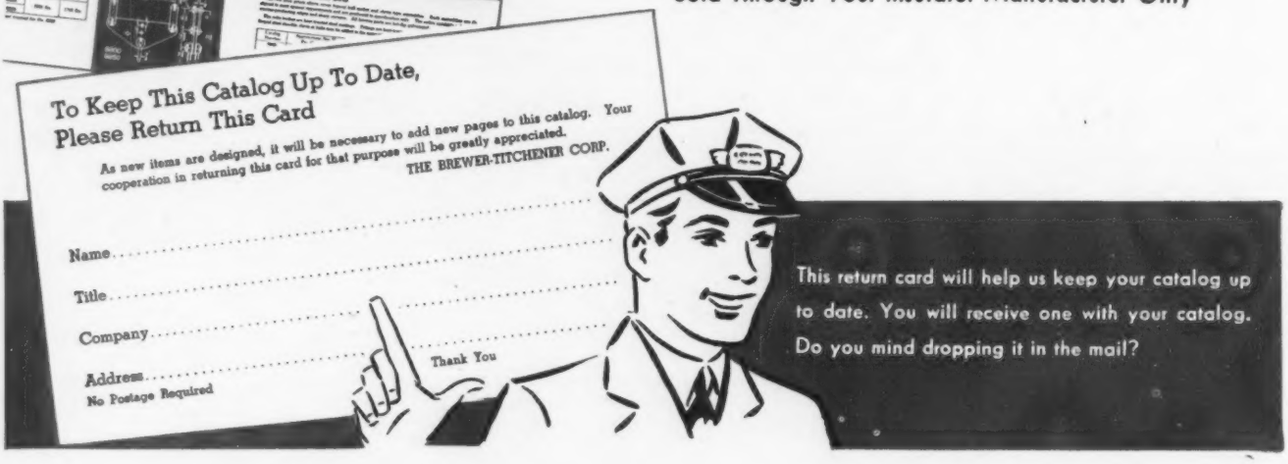
B.T.C. is getting so accustomed to giving the trade special attention that it's even creeping into the advertising department. Yes, wherever it is humanly possible, a uniformed messenger will make a delivery of your catalog to you personally. Of course there are a few places we can not reach by messenger. Uncle Sammy will take care of these.

We have designed this catalog as a valuable working tool and sincerely hope it comes up to expectations. Incidentally, if there are others in your office that would like copies, let us know. There is a return card slipped in the cover for that purpose.

THE BREWER-TITCHENER CORPORATION

CORTLAND, N. Y.

Sold Through Your Insulator Manufacturer Only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In the interest of National Defense we urge your cooperation with all wire and cable manufacturers.

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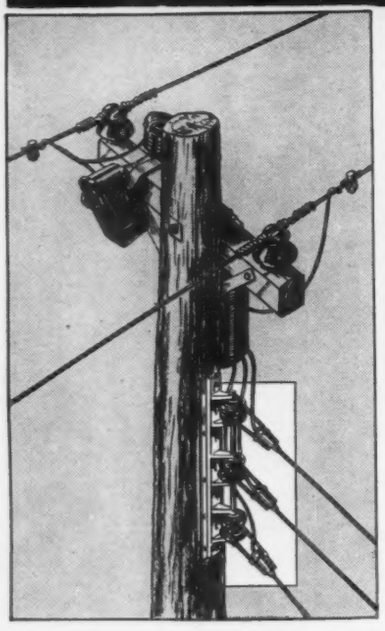
modernize
YOUR
DISTRIBUTION
PRACTICE—



Single phase grounded neutral in city distribution.

RELIABLE
STRAIGHT-
THRU
DEAD
ENDS

Reliable Straight-thru Dead Ends with flexible clevis are low in cost and permit the use of hard wide in secondaries. They simplify the take-up of slack — easily installed on either strain or spool insulators.

Reliable
ELECTRIC COMPANY
OVER 30 YEARS SERVICE TO THE UTILITIES
3165 CARROLL AVENUE • CHICAGO ILLINOIS

PRODUCTS
that are news

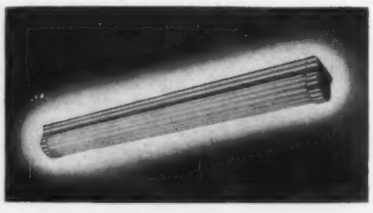
Washer Styling (500)

Apex-Rotorex Corp., for its 1941 Model 372 washer—plays up its spiral dasher and drain controls of attractive gray molded plastics. A large tub, 20-gal. capacity, is finished in white vitreous porcelain. Tub has dome-shaped

rolled-in edge, "washboard" sides, and patented quickdrain bottom. Maximum capacity 9 lb., washable in 6 to 8 min. The new design Apex-Lovell wringer has an extended top, giving easier access to the rolls.

Glass-enclosed Fluorescent (501)

The F. W. Wakefield Brass Co. have produced a glass-enclosed fluorescent unit designed for single use or as continuous luminaire. One feature is that each unit houses all ballast equipment; where two or more units are interconnected, 2-lamp ballasts are used to minimize stroboscopic effect. Glass-



ware is reeded opal glass of sufficient density to reduce brightness. High illumination levels are obtainable by using as a continuous luminaire 65-ft. candle with 3-in. spacings; 25-ft. candle with 8-in. spacings. Glassware can be removed for relamping by sliding along panels.

Pneumatic Operator (502)

A pneumatic operator for the high-speed operation of large outdoor oil circuit breakers is announced by Allis-Chalmers Mfg. Co. The new operator, designated type TM-700, is suitable for fast reclosing service, reclosing time within 20 cycles (60 cycle timing) having been obtained when using the TM-700 in conjunction with a standard 60-kv. 600-amp., 5000-kva. outdoor oil circuit breaker. The type TM-700 is also particularly suitable for installations where a d.c. supply is not available, and where operations of an a.c. source through a rectifier are not considered desirable. The new type consists essentially of an air cylinder and piston, and mechanically trip-free mechanism. Auxiliary compressed air storage tank stores enough air for three closing operations before recharging is required.

Small Oven (503)

Within its capacity, the new Universal Automatic Oven operates as efficiently as a standard electric oven. It can be operated from any baseboard outlet, provides advantages of electric cookery, and offers at low cost comfort, cleanliness and certainty of results of modern electric cooking. This oven requires no special wiring, is equipped with a roasting pan and broiler rack and is finished with white baked enamel trimmed in black. Stainless steel bands and porcelain-enameled inside, it is also heavily insulated.

A.C. Arc Welder (504)

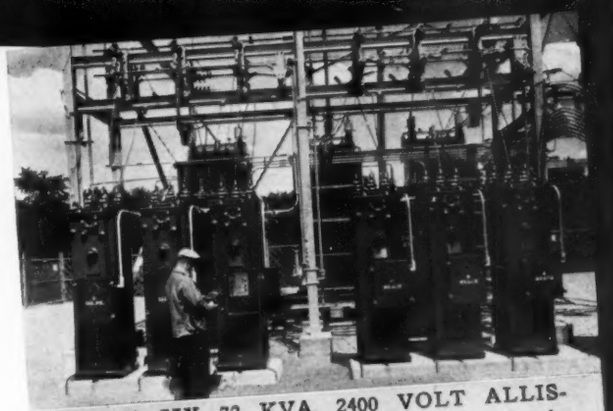
Simplified welding is claimed as the advantage of a new a.c. electric arc welder manufactured by Ideal Commutator Dresser Co. Design includes a reactance winding on a separate core in addition to the transformer which acts as a stabilizer, making it easy to strike an arc and hold it. Fifteen different welding heats between 20 and 175 amp. give the operator accurate heat and penetration control. Penetration may be up to ¼ in. if desired. Standard welder is for 230 volt, 60 cycle.

Utility Fuse Puller (505)

James R. Kearney Corp. has available a utility fuse puller, designed to open and remove doors in porcelain housed cutouts. It will also remove cartridges from open type fuse switches. Angle of the jaws may be quickly changed to permit the removal of door from almost any angle. Jaws have a maximum opening of 3¼ in. Head is available for 1¼-in. pole mounting with fit-on attachment for fit-on poles and for use in Saf-T-Hook Clamp Sticks.

ASK YOURSELF THESE FIVE QUESTIONS!

Then Decide if You're Buying the Best Regulators for the Job to be Done. Here are the Facts on the Five-Way Savings You Get with the Allis-Chalmers 5/8% Step DFR Feeder Voltage Regulator!



THESE SIX 72 KVA, 2400 VOLT ALLIS-Chalmers 5/8% Step DFR Regulators on a northwestern system give the right answers to the five fundamental questions of regulator economy.

1 **HOW CLOSELY DO THEY REGULATE?** Allis-Chalmers' DFR . . . with "Feather-Touch" Control . . . permits band width settings within ± 5/8 of 1%.

2 **DO THEY INCREASE WATTLESS CURRENT?** Actually excitation current of the DFR is *only a fraction* of that required by older types of regulators. That means you don't have to install costly static capacitors to release system capacity for pay loads.

3 **ARE THEIR LOSSES HIGH?** No . . . for at the neutral position, the copper loss of the Allis-Chalmers DFR approaches zero. You get more efficient operation in the range where the highest percentage of operations occur.

4 **ARE THEY TOO NOISY FOR URBAN STATIONS?** Quiet-operating DFRs . . . with no air gap, fringing flux, or clatter of relays . . . make no more noise than a distribution transformer of equivalent size.

5 **WHAT ABOUT MAINTENANCE EXPENSE?** No holding or braking devices are necessary on the DFR. And complete oil immersion of all moving parts eliminates the need for other lubrication. What's more, in the seven years Allis-Chalmers 5/8% Step Regulators have been in service, *not a single contact has ever been replaced due to deterioration under normal operation!*

For all the answers on the famous five-way savings of Allis-Chalmers 5/8% Step DFR Regulators, call the district office near you. Or write direct to Allis-Chalmers, Milwaukee, for your copy of our new bulletin B-6065. A 1312

MEET REGULATION'S BIG FIVE!

*1. CLOSER REGULATION!
2. LOWER EXCITATION CURRENT!
3. REDUCED LOSSES!
4. QUIETER OPERATION!
5. MINIMUM MAINTENANCE COSTS!

***SIMPLIFIED "FEATHER-TOUCH CONTROL" PERMITS CLOSER BAND WIDTH SETTINGS!**

Because the energy handled by the relay contacts is small, no compounding or holding coils are necessary to prevent contact burning . . . the relay is free to follow each voltage fluctuation without excessive damping, resulting in the unique "Feather-Touch" action.

Coupled with the DFR's small steps — only 5/8 of 1% — this permits band width settings within ± 5/8% . . . closer regulation for your feeders.

These 5/8% Step Regulators Are Famous for Better Regulation at Lower Cost! Choose the Regulator to Fit Your Purpose!

DFR — 12 to 250 kva, single phase
AFR — 20.8 to 750 kva, three phase
CFR (air cooled) — 36-96 kva, 2400 volt, single phase

ALLIS-CHALMERS
MILWAUKEE·WISCONSIN

New Norge Design (506)

The 1941 line of Norge Ro-ta-tor Washer has several mechanical improvements and changes in exterior design. Mechanically, the new line offers throw-around washing action; new damp-drier; safety pressure release; double safety interlocks; Norcelain finished drainboard; Ro-ta-tor lock cap and automatic lifter; feather-weight plastic Ro-ta-tor. Five electric models, and three gasoline-powered models offer complete coverage of the entire price field. An electric motor cradle is provided with all gas-powered models so that electric power may be installed at a later date.

G-E Fan Line (507)

General Electric announces a new standard line of electric fans for 1941. It includes 8, 10, and 12-in. fans with newly designed wide blades which provide forceful delivery quietly. An addition to the standard models is one at the lowest price ever offered by the company for a 16-in. oscillating fan. The smart modern styling of the smaller standard fans makes use of molded plastic bases and a curved motor support plated in chrome.

Portable Light Flexible (508)

Sterling Reflector Co. offers new flexibility in adjustment of a portable light; a simple sliding adjustment controlled by a wing screw affords easy and positive positioning

of lamp over an arc of 90 deg. and more. Weighted base and adjustable shade add to the flexibility.

MEET CONTRACT DATES with IDEAL

Wire Nuts

SOLDERLESS—TAPELESS WIRE CONNECTORS

Strip Wires — Screw on — That's All

- No solder, no heat, no open flame hazard.
- Better electrically—stronger mechanically.
- Sizes for all common wire joints.
- Fully approved: Listed by Underwriters' Laboratories, Inc.

Millions in Use!

IDEAL

NEW

JOIST BORING MACHINE

- Bores through joists, rafters, etc.
- No climbing—no stooping—no straining.
- Works 11 ft. above or below floor level.

OTHER IDEAL PRODUCTS

IDEAL SOLD THROUGH JOBBERS

IDEAL COMMUTATOR DRESSER COMPANY

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STRENGTH, ruggedness and durability are combined with definite economy in *Crapo* Galvanized Steel Strand. Low first cost, low maintenance expense are matters of record wherever this time-tested product is in use. Available in all standard grades and sizes from representative jobbers throughout the country. Or, write—

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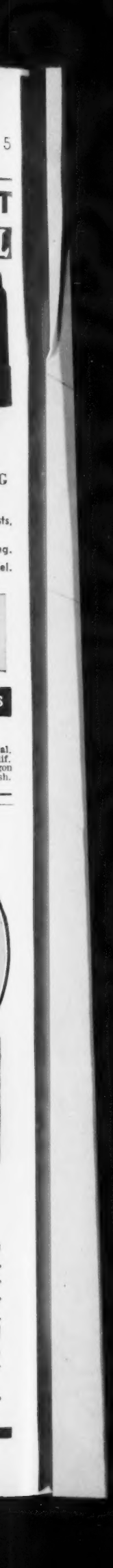
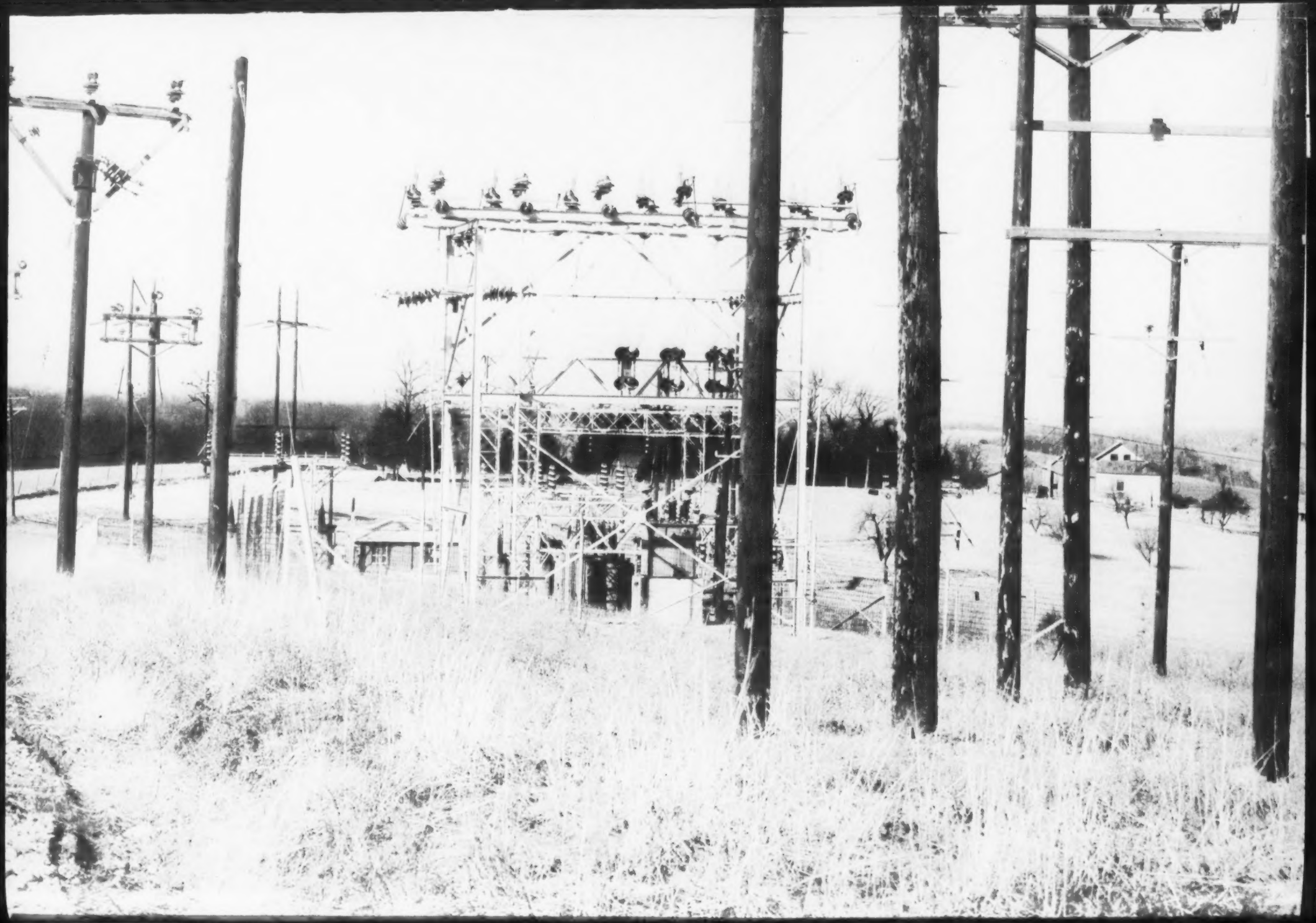


A Handy Arrangement for Maintaining Proper Fuse Coordination– *Using* KEARNEY FUSE LINK DISPENSER Mounted at the Pole

Information Within These Pages—



For Better Service—

INSTALL TRICO

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RENEWABLE FUSES
With the famous Powder-Packed Element

KLIPLOK CLAMPS
Lock fuses and clips together

KANTARK FUSES
With genuine fibre tubes (not paper)

COLORTOP PLUG FUSES
The color tells the size

FUSE PULLERS
Pull and replace fuses safely

OILERS
Glass and Unbreakable types for every application. Stops guesswork - bearing failures- waste- idle machinery, etc.

WRITE FOR FOLDER No. 300

TRICO FUSE MFG. CO., Milwaukee, Wis.

M. L. Woodard, 387 9th St., San Francisco
W. E. Young Co., 1944 Broadway, Denver

Delco Ventilating Fans (509)

The new low-price line of Delco Northeaster ventilating fans in 10- and 12-in. sizes of both wall box and window panel type have been introduced by Delco Appliance Division of General Motors Sales Corp. These

fans are built in the non-reversible types. 10-in. models are equipped with semi-wide blades. Motors are re-designed with guard cases finished in attractive Cadmium plate. The wall box is of an entirely new cylindrical type constructed to be extended from 5½ to 13½ in. 12-in. model wall box is square in shape, has an inside door and fixed outside louvers. It may be adjusted from 8 to 15 in. The 10-in. window panel model can be extended from 23 in. to 36 in. and the 12-in. model from 27 in. to 37 in.

Induction Motor (510)

Westinghouse Electric & Mfg. Co. has an open-type sleeve-bearing, squirrel-cage induction motor designed for general purpose drive application such as machine tools, pumps, auxiliary drives, and others. These type CS motors are available in ratings from ½ to 5 hp., at speeds from 875 to 3600 rpm, for operation on 110, 220, 440 and 550 volts, two and three phase a.c. More compact, the new motors are strong mechanically.

Four Water Heaters (511)

Four new galvanized tank special electric water heaters, in 30-, 40-, and 50-gallon sizes, are announced by General Electric appliance and merchandise department. The new heaters, each with twin units will supplement the special 30-gallon water heater, having a single unit, announced last year. The new 30-gallon heater, has a 600-watt for the lower and 1000-watt for the upper unit. The 40 has a 750-watt lower unit and a 1250-watt upper unit. One of the new 50-gallon models has a single lower unit, rated 2500-watts, and the other a 1000-watt lower unit and a 1500-watt upper unit.

Window Air Conditioner (512)

A portable window-type air conditioner has been announced by Carrier Corporation. In addition to all summer air conditioning functions, this unit provides means for controlled ventilation. The unit is of 5700 b.t.u. capacity, and a control makes it possible to mix outdoor and room air in any proportion desired. A smoke exhaust flushes out tobacco smoke and other odors.

ECONOMICAL

Jeffries Transformers

Reasonable in Price
Reliable in Performance

Jeffries large transformers are priced reasonably—and you can save their first cost in a short time by minimizing current losses. When you use a Jeffries transformer, you can provide voltage change at the point desired, without prohibitive expense.

We supply all types and sizes. If not in stock, we build to order in a hurry—a week to 10 days.

Write today for catalog

JEFFRIES TRANSFORMER COMPANY

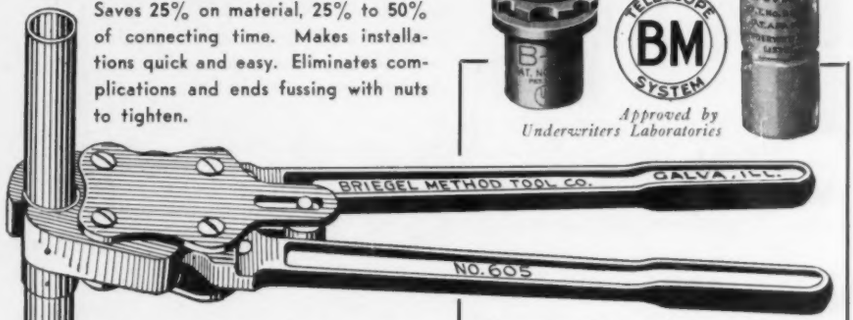
1710 E. 57th St. Los Angeles, Calif.

Save 25% . . . in Material and Connecting Time
WITH B-M CONNECTORS AND COUPLINGS

Popular, Simple Method

Saves 25% on material, 25% to 50% of connecting time. Makes installations quick and easy. Eliminates complications and ends fussing with nuts to tighten.

Approved by Underwriters Laboratories



Only One Tool Needed!

Costs you only $1.25 for the patented B-M indenter (½" size handles 80% of all installations). Just two squeezes, and you have a smooth, neat connection. No other tools required. This tool can save you many times its cost on the first job.

Strong, Neat Connections

You welcome the speed and ease that the B-M system puts in your hands. These fittings give you complete, WELL FINISHED WORK in a hurry—on all average jobs (they're non water-tight).

Distributed By

The M. B. Austin Co. Chicago, Ill.
Clayton Mark & Co. Evanston, Ill.
Clifton Conduit Co. Jersey City, N. J.
General Electric Co. Bridgeport, Conn.
The Steelduct Co. Youngstown, Ohio
Enameled Metals Pittsburgh, Pa.
National Enameling & Mfg. Co. Pittsburgh, Pa.
Triangle Conduit & Cable Co. Elmhurst, New York City

BRIEGEL METHOD TOOL CO., Galva, Ill.

KLEINS...

FOR THE MAN WHO KNOWS PLIERS

"Since 1857"

ASK the old timer who has been up on the sticks since the turn of the century. Ask the grunt who wants to be up there, too. Ask any lineman or electrician anywhere—he'll tell you that only one kind of plier is good enough for him—the kind that carries the Klein trademark. Such universal recognition of quality by men who know is what has made the name Klein first in electricians' tools "since 1857."

Your copy of the Klein Pocket Tool Guide will be sent on request.

ASK YOUR SUPPLIER

Foreign Distributor:
International Standard Electric Corp., New York

Mathias KLEIN & Sons
Established 1857 Chicago, Ill. U.S.A.
3200 Belmont Avenue, Chicago, Illinois

New Ironer Models (513)

Landers, Frary & Clark have four new ironer models whose selling features include Knee-type adjust-a-trol which leaves both hands free in starts and stops roll at one push; a lap guard that keeps damp clothes off the operator's lap; pilot light; two-speed wrinkle-proof roll with 26-in. ironing surface; economy shoe scientifically designed for low current consumption with a non-scratch surface; duo-thermostat control; drop leaf end table with swing-back balance hinges; ruffling plates for ironing ruffles and frills; acid-resisting white porcelain enamel table top.

Disconnect Switches (514)

Railway and Industrial Engineering Co. have two special purpose disconnecting switches which embody refinements of design of the regular line of high-pressure contact equipment. On voltage regulator installations, either switch replaces three conventional disconnects and yet requires no more mounting space than any one of the three swtches replaced. Added to this saving is a material reduction in the amount of wiring and equipment on the pole, for lower installation cost and safer installation, safer because with either the type "BB" or "EBD" there is no question about which switch to open first.

Infra-red Lamps (515)

Three new infra-red heat lamps will be placed on the market by the Birdseye Division of Wabash Appliance Corp. Two of the lamps will be clear, for use with the standard gold-plated or Alzac reflectors; the third will be built with its own reflector lining sealed inside. Complete information on these heat lamps and on the subject of baking, drying and dehydrating with infra-red radiant energy is contained in a bulletin just issued by the company.

Vacuum Leader (516)

Electric Vacuum Cleaner Co., Premier Div., announces as the top of its new line for 1941 a de luxe model No. 11 floor cleaner, with the Matho-Matic nozzle which automatically adjusts itself to any floor surface. Improvement of the cleaner handle from vertical to normal cleaning position brings the automatic adjustment into operation. Other details include: 2-speeds, 350-watts, ball-bearing motor; ball-bearing, motor-driven double brush; foot-controlled handle release; search-light; radio interference eliminator; accordion-top bag with dirt trap.

Generator Regulator (518)

A new indirect-acting rheostatic generator-voltage regulator, designed especially for automatic voltage control of medium and large size ac generators in central stations, or large municipal and industrial generating plants, and for synchronous motors and condensers, is announced by Westinghouse Electric & Mfg. Co. This new type BJ regulator is especially adapted for use on systems where quick-response excitation is used to improve stability under fault, or large load conditions. Distinctive in operation is its high-speed. Action time is within 3 cycles after a voltage change. This, and its ability quickly to force the exciter field to its limit makes it suitable for quick-response systems. The regulator element responds to average 3 phase voltage, hence will not operate falsely on an unbalanced system fault.

New Washer Models (519)

Automatic Washer Co. has available for the trade a line of 10 models: five single-wall, three double-wall, two spin-dry models. Model No. 4180M (illustrated) with double-wall tub has super "wring-master" wringer. Oversized cushion rolls revolve in four stainless steel ball-bearings. Release and reset lever encased in ribbed rubber. When released, there is a 3¼ in. clearance between rolls. Exclusive invertible duo-disc agitator; provides the advantages of "submerged" and "surface" agitation in one washer.

Time Delay Switch (520)

Betts & Betts Corp. has developed a new time delay switch to provide a predetermined time delay in electrical control. Designed for laboratory and industrial application in conjunction with magnetic relays and generally used where temperature changes are fairly constant and slight variation in timing are not detrimental. (Special compensating switches are provided where accurate delay is essential). The switches are made as small as technically possible without sacrificing performance. Provided with four terminals, two for the heater coil, two for the main circuit they are adjustable within time limits of one second to five minutes. Available in immediately or not immediately recycling types, normally open or normally closed models, sizes with soldering lugs are 3" x ⅞" x ⅞"; with binding posts 3" x ⅞" x 1¼".

"Lite Line" System (521)

Benjamin Electric Mfg. Co. has announced a new "Lite-Line" system of continuous line fluorescent lighting. Significant points of the new system are: a long, continuous light source to conform with modern architectural trends. Increasing illumination to provide 35 to 100-ft. candles on working planes without involving changes in existing wiring, bringing to lighting equipment the flexibility and economy of sectional assembly. RLM "lite-line" units utilize the 48-in. Mazda fluorescent lamps and are available in a single and double reflector length. These units may be joined together in series to form a continuous fixture of any length. Change-over from twin lamp to triple lamp operation can be effected when two-lamp units are purchased with a triple lamp reflector and by installing the additional ballast, compensator, socket switch and lamp.

Only 6 Years Old — *but look where*

400,000 Victor 10" High Strength Suspension Insulators are now in Service!

Thanks to our many friends for our Birthday cake, April 28, 1941.

These units are on lines operating at all voltages up to 220 KV. Practically all were subjected to tests and inspection by our customers under specifications recognized as the most rigid ever imposed on any suspension unit.

Combined mechanical and electrical strength averages so high on our standard unit we do not hesitate to guarantee them to be the best you can obtain ANYWHERE at equal prices.

Also furnished with conductive glaze—TYPE "R".

V *The Mark of a* **GOOD** *Insulator*

VICTOR INSULATORS, INC.

VICTOR, NEW YORK

SAN FRANCISCO PORTLAND

MAYDWELL & HARTZELL INCORPORATED

Engineers & Manufacturers' Representatives

LOS ANGELES PHOENIX

BULLETINS

data books, etc.

Keep Posted for 1c

Your being right up-to-the-minute may have an important bearing on your success. New developments are appearing daily in your field—tools to help you do a better job. Are you abreast of them? You fall back a step when the other fellow is well informed about a subject of which you are ignorant. Manufacturers' publications are a quick, efficient way for you to keep posted on current events in your field.

Isn't it a bargain to invest 1c (the cost of a postcard) to help earning power to which you look forward? American industry is offering a remarkable service—free. ELECTRICAL WEST makes it easy for you to enjoy this service for your own. Check and mail the coupon below. That's all you have to do to help yourself toward better performance and greater rewards.

Magnetic Drive (522)

"Magnetic Variable-Speed Drive" is a 12-pg. publication which presents the principles, characteristics, advantages and constructional forms of magnetic drives. The Electric Machinery Mfg. Co. are the publishers of this bulletin, which completely describes this phase of the electrical industry. Scale breakdown drawings in color are provided, illustrating the theory of a constant speed motor plus magnetic drive giving adjustable, variable speed for fans. Percent tables showing torque characteristics, straight line control currents and low average losses are included in the bulletin.

Downlights (523)

Rambush, designers and manufacturers of incandescent "Downlites," have available a booklet illustrating various types of their lighting units and special uses.

Tools

T. J. Cope, Inc., manufacturers of tools and equipment for insulation of underground and overhead electric cables, have published a new catalog illustrating and giving specifications of various Cope products. Items shown are completely described and cutaway views show construction features.

Submarine Cable (524)

American Steel & Wire Co. have issued an attractive, 16-page booklet on Submarine Cables with illustrations of various applications and descriptions of typical installations. The booklet is colorful and well-arranged and should prove of considerable interest to engineers in the field of submarine cable work.

Wire Grips (525)

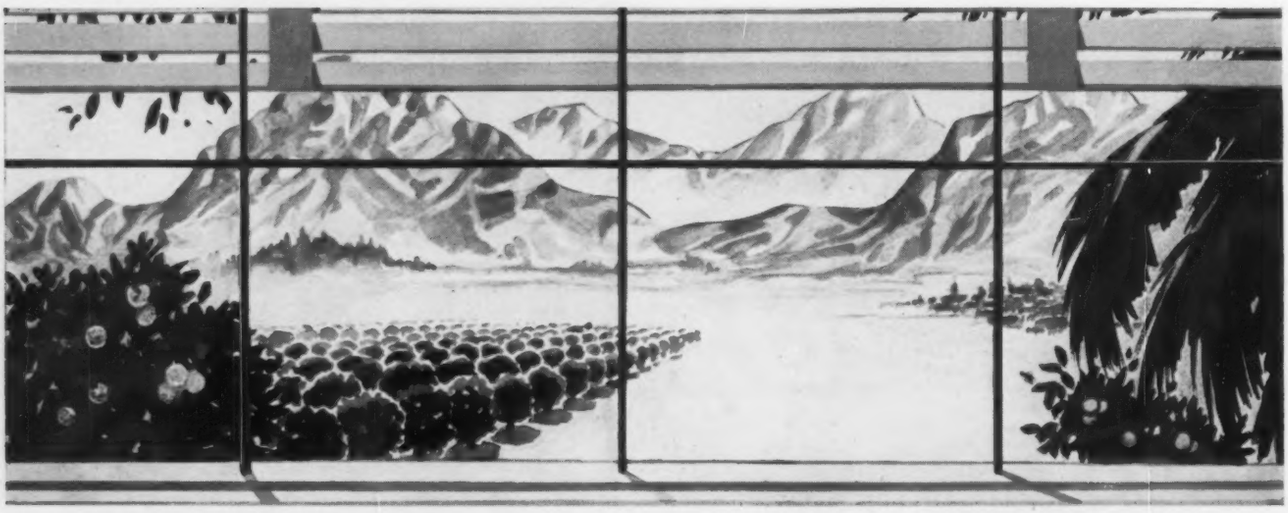
National Electric Products Corp. has produced a dramatic, 20-page booklet on National Electric "Gorilla Grip Connectors." The booklet is illustrated with drawings and cutaways showing sizes and specifications of these National Electric Co.'s products.

Industrial Light (526)

A two-color, illustrated bulletin has been issued by Daybrite Lighting, Inc., on "Super 200." This unit is designed for two 60-in. 100-watt fluorescent lamps. Having greater wattage, this unit can be spaced at wider intervals, with greater mounting heights. The Super 200 is available with two types of reflectors—either with apertures (two rows of slots which allow light to pass through to the ceiling) or without apertures. Through these apertures approximately 2 per cent of the light will be thrown upward, thus relieving the contrast between the fixture mount and the surrounding ceiling area.

Ballasts (527)

Acme Electric & Mfg. Co. has published a Fluorescent Lamp Ballast Catalog covering their entire line of 26 types of lamp ballasts now available for fluorescent lamp application. According to the bulletin, entire line of ballasts has been engineered to provide balanced secondary voltages on all 2-lamp units, providing equal volteges for each lamp, and eliminating the objection in which the fixture contains one lighted lamp, and one lamp either not functioning or flickering. The bulletin presents in tabular form specifications and dimensions of the units and a diagram of the line's source and light.



Provide California's Best Climate Indoors

Learn what the heating and air conditioning industries have developed to guard health, promote comfort, increase industrial efficiency and make manufacturing processes independent of outdoor weather. Come to the Pacific Coast's own Heating and Air Conditioning Exposition. See the many new opportunities opened for applications of electrical equipment.

Leading manufacturers throughout the nation will exhibit their latest contributions to indoor weather control. Whether you sell electrical energy, equipment and supplies, or serve as an engineer, contractor or dealer, don't miss this outstanding exposition.

Note the place and date. ***Admission is by registration.***

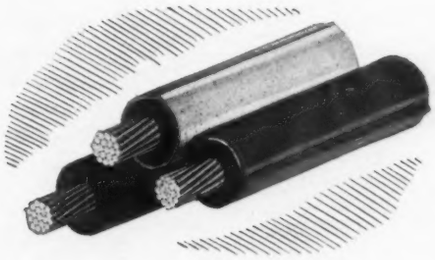
PACIFIC HEATING & AIR CONDITIONING EXPOSITION

Under Auspices of the American Society of Heating and Ventilating Engineers

EXPOSITION AUDITORIUM, San Francisco · JUNE 16-20, 1941

MANAGED BY INTERNATIONAL EXPOSITION COMPANY

258



. . . worth planning for

Okoprene-sheathed insulated wires and cables — braidless, with a bonded sheath of **neoprene** vulcanized to the rubber insulation—provide superior protection against sunlight, ozone, chemicals, moisture and oil. They have eliminated corona-cutting and ozone generating as sources of trouble. They are easy to splice and simple to install.

All of these qualities have made Okoprene-protected wires and cables increasingly desirable to industry and now they are also essential to Defense. These, together with other Defense uses of neoprene, have resulted in a temporary rationing of this important synthetic. (Temporary, because increased production facilities now being installed will soon make available a vastly increased supply of neoprene.)

Since this has limited our production of Okoprene cables, it is necessary for us to ask you to make your plans a little further ahead . . . to place your orders as far in advance as possible and to consult more freely with our Engineering Service Department regarding the construction and type of cable which will serve you best.

The many advantages which Okoprene protection offers for many kinds of installations make these outstanding wires and cables well worth planning for.

THE OKONITE COMPANY, Passaic, New Jersey
Offices in principal cities

Wire and Cable (528)

A new catalog just issued by the U. S. Rubber Co. contains complete specifications for every type of building wire and cable—single conductor and multiple conductor, rubber insulated and synthetic insulated, fibrous covered and lead covered. Also included are descriptions of fixture wire, non-metallic sheathed cables, service entrances, service drops and underground service entrance cables. The book runs 52 pages and is well illustrated.

EASY WAY TO GET INFORMATION

To keep posted, simply circle the items in which you are interested, cut out the coupon (it can be pasted on the back of a postcard) and mail to:

ELECTRICAL WEST, 68 Post St., San Francisco, California
Please send me the following CIRCLED items:

500	501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520	521
522	523	524	525	526	527	528	529	530	531	

Name..... Company*..... Title*.....

Address

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

MODERNIZE with *Nicopress*

The Up-to-the-Minute Method for SPLICING and DEAD-ENDING

Nicopress Splices and Dead-Ends are quickly and easily made.

Neat in appearance and not much larger in diameter than the wire, Nicopress splices and dead-ends are as strong or stronger than the rated breaking strength of the conductors, and so tight the wires cannot pull out.

Nicopress Line Wire Sleeves, Dead-Ends and Tools are being used by a large number of power and light companies throughout the world with eminent satisfaction.

Order from your jobber today and start eliminating your splicing and dead-ending problems.

THE NATIONAL TELEPHONE SUPPLY CO.

Canadian Mfr.—N. Slater Co., Ltd., Hamilton, Ont.
Export Distributor—International Standard Electric Corp., New York, N. Y.
5100 SUPERIOR AVENUE CLEVELAND, OHIO

Air Circuit Breakers (529)

An 11-page leaflet describing compressed air circuit breakers up to 34.5 kv., 1,500 kva. interrupting capacity for indoor use is available from Westinghouse Electric & Mfg. Co. Distinctive features, construction, and operation are discussed in detail with special attention given to the compressed air mechanism. Diagrams give physical dimensions and typical layouts. Rating tables list necessary data for breakers with rated voltages between 2.5 and 34.5 kv.

* * *

Rural Boosters (530)

Feeder-voltage boosters for use on 2400- to 7960-volt lines are described in a 7-page illustrated bulletin announced by Westinghouse Electric & Mfg. Co. These boosters are particularly applicable to rural lines or distribution circuits where the load changes once or twice daily from light to practically full load. Three main parts consisting of transformers, top changing mechanism and control are described.

* * *

Pin Insulators (531)

Pin-type insulators for power transmission service are described in a new eight-page leaflet announced by Westinghouse Electric and Mfg. Co. Radio interference proof insulators with ratings between 95 and 200 kv. are discussed. Multipart, one piece, and bullet resistant designs are described with a note on pin holes and post type units. Flash-over voltage, arcing distance, and other data are tabulated. Physical dimensions are shown by cutaway sketches. Descriptive Data: 39-180.

Letters to the Editor

Dear Sir:

Arc welding can easily take care of its enemies if it can only be delivered from the machinations of its friends.

Arc welding progress is being held back much more by people who could know the facts and will not than by all the people who condemn it from ignorance. This is a unique situation.

This fatherly criticism has condemned the consumer of welded products to the loss of many welding economies. It has also forced the would-be user to antiquated methods which are less reliable and more dangerous. The reasoning of these fatherly critics is that since no one can see into a welded joint therefore it should not be used. However, this same critic does not hesitate to use steel which, without question, is equally dense and much more variable in quality.

It is a peculiar quirk of human nature that the average man hesitates in adopting new ideas. This perhaps is a very admirable trait. The consumer, however, by this same conservatism, is condemned to paying more for an inferior article. Many millions of dollars of loss is incurred by him yearly because of this same conservatism. This loss can be justified for a proper trial period but not longer. This proper trial period expired many years ago.

It is time that we overcome this truly American trait in which we take so much pride. We should not allow this economic loss to continue merely because of our ideas of conservatism. After all, these conservatives do not pay the bill. That is paid by the consumer who wants progress and safety. He is tired of paying for Tacoma bridges which, if designed for welding, would have cost less and still be standing. He wants the economy and safety for a homogeneous structure which only welding gives and he wants it now.

THE LINCOLN ELECTRIC CO.,
J. F. Lincoln, President.

HERE'S REAL *DUCT ECONOMY*

Economy at installation

Savings are immediate when you use Transite Ducts. Made of asbestos and cement, Transite *Conduit* is so strong that no protective casing is needed underground. And, on exposed locations, its light weight, 10-foot sections and simple assembly speed up work, cut costs. Where an encasement is required, Transite *Korduct* provides maximum duct economy. Thinner-walled than Transite Conduit, otherwise identical, its long lengths cut down the number of spacers needed, mean fewer joints. And because both these better ducts have a permanently smooth bore, cable pulls are easily made not only at installation, but also during replacements even after years of service.

Economy in maintenance

Completely fireproof, Transite Ducts minimize burnout troubles . . . won't generate dangerous fumes or gases. On concreted-in work, they actually provide extra fire protection between cables. In all cases, maintenance stays low, for Transite Ducts won't rot or rust, offer unusual resistance to weather and corrosion.

Economy in cable operation

Increased system efficiency features every Transite Duct installation. Transite's high rate of heat dissipation provides greater system capacity or the lower cable operating temperatures that result in decreased copper losses, and longer cable life.

If you are not now taking advantage of the new economies in distribution possible with Transite Ducts, may we send you details? Write for brochure DS-410. Address Johns-Manville, Los Angeles, San Francisco or Seattle.

JM Johns-Manville

TRANSITE DUCTS

TRANSITE CONDUIT . . . for exposed work and for installation underground without concrete encasement.

TRANSITE KORDUCT . . . for installation in concrete. Thinner-walled, lower-priced, but otherwise identical with Transite Conduit.

WHY MAGNETIC STABILITY?

ONE absolute necessity for maintained watthour-meter accuracy is a magnet that is dependable. Therefore, our engineers decided to use alnico magnets only after they had developed a design which conclusive tests proved to be magnetically stable.

To obtain maximum benefit from the advantages inherent in alnico, the mechanical construction must be absolutely permanent. That is why G-E alnico magnets have an all-welded, one-piece construction.

Added safeguards to magnet permanence are the stabilizing treatments given to prevent changes in strength with age. Each step in the manufacture of G-E alnico magnets has been developed and is controlled to assure the permanency of accurate registration — under conditions of widely varying loads and temperatures — which has always been typical of the I-30 line of watthour meters.

General Electric Co., Schenectady, N. Y.

GENERAL ELECTRIC

601-6-110

We are doing a good
job of supplying 100% production
without sacrificing quality

Sherarduct "it bends"

Dilec "smallest diameter"

A·B·C Cable "genuine"

"perfect boxes"

Gorilla Grips "precision fit"

National Electric Products Corp. Pittsburgh, Pa.

NATIONAL
Outstanding Reliability
safeguards the wheels of industry
● Urgent demands for production emphasize the need for dependable power in every phase of industry — raw material production, manufacturing and transportation.
The uniformity and exceptional commutating properties of "NATIONAL" Carbon Brushes have earned for them a reputation for outstanding reliability which is your best assurance of dependable power on electrified equipment.
SPECIFY NATIONAL BRUSHES
TRADE-MARK
NATIONAL CARBON COMPANY, INC.
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CARBON SALES DIVISION, CLEVELAND, OHIO
General Offices: 30 East 42nd Street, New York, N. Y.
BRANCH SALES OFFICES
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MORE THAN A MILLION HOTPOINT RANGES SOLD!

←THE ARISTOCRAT —Replica of Hotpoint's One Millionth Electric Range; De Luxe Features $179.50* f. o. b. Chicago Installation Extra

NEW CENTURY, full → capacity Hotpoint Electric Range. All porcelain enamel; 5-Heat Calrod Units; Thrift Cooker. $99.95* f. o. b. Factory Installation Extra

Reprinted from Editorial in "Air Conditioning & Refrigeration News" of March 26, 1941.

A Million Ranges

MONDAY of this week the millionth Hotpoint electric range was produced by the Edison General Electric Appliance Company.

Ordinarily the NEWS doesn't get excited about the "millionth unit" of anything. It is an old publicity gag. But this case has unusual significance.

In addition to the George Hughes angle (he is the man who started the industry and kept it alive through a quarter century of discouragement, slow progress, obstacles, and eventual triumph), it gives definite point to the editorial argument so often presented on this page in the last two years that the electric range is now definitely big-time.

More than any other companion appliance we know of, it offers the refrigerator dealer an opportunity for profitable volume this year.

Hotpoint Writes A "Big Time" Success Story! *Producing More Than A Million Electric Ranges Marks A Turning Point!*

A MILLION electric range sales are a lot of sales for one manufacturer. This makes the electric range definitely "big time." Hotpoint feels proud to have helped write this big-time success story with its retailers.

Hotpoint always has tried to think *ahead* of the market, to plan for the future. We have thought ahead in product design: over $1,000,000 has been spent in developing the new Improved Hi-Speed Calrod Unit, the fastest durable heating unit known. Hotpoint also pioneered Five Measured Heat Switches, Automatic Oven Temperature Control, Flavor-Seal Oven, 5-Heat Thrift Cooker, and many other features.

We have thought ahead by supplying "big time" Promotion Plans and National Advertising to guide public opinion towards the electric range and so help retailers to sell over a million Hotpoint Electric Ranges.

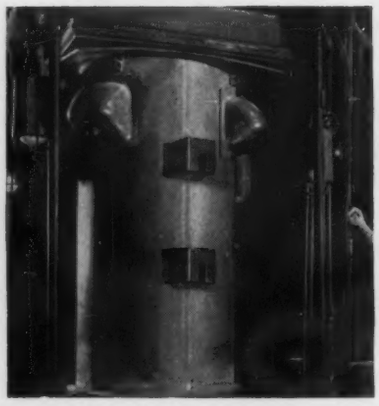
As Hotpoint swings into its *Second Million* Electric Ranges the trade realizes that the switch to electric cooking marks a profitable future for those appliance retailers selling Hotpoint Electric Ranges. The Electric Range is a fast-selling appliance that will make money for you from now on. Get the whole exciting story from your Hotpoint distributor, or Edison General Electric Appliance Co., Inc., 5612 West Taylor Street, Chicago, Illinois.

Hotpoint

Electric Ranges · Refrigerators · Water Heaters · Clothes Dryers · Washers and Ironers · Automatic Dishwashers · Electrasink · Steel Kitchen Cabinets

REASONS WHY ENGINEERS CHOOSE THE NEW

1 Simplified Supports for Direct Pole Mounting Cut Installation Time. Standard Support Spacing and Bushing Location Mean Complete Interchangeability of All Sizes and Makes.



2 New, Durable, Copper-Bearing Steel Tanks. Tested Under Pressures Far Greater than Normal . . . Prevent Oil Leakage, Assure Long Life and Complete Safety.

3 New Spra-bonderizing Process . . . Plus Triple Coat Automobile Finish Give Tanks Positive Four-way Protection Against Attacks of Rust and Corrosion.

"I Like Its Six Big

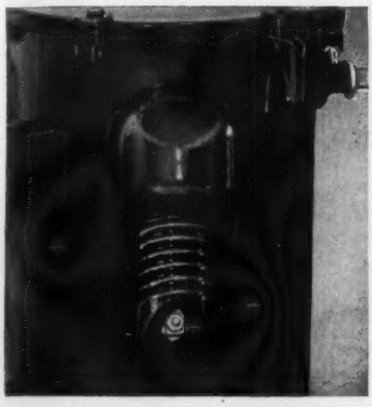
You'll Like The Engineering Advancements Built Into the New Allis-Chalmers Distribution Transformer to Give You Easier Installation . . . Greater Dependability . . . Money-Saving Operation!

It's here! The transformer you helped us design — the new Allis-Chalmers EEI-NEMA Distribution Transformer!

By pooling the knowledge of hundreds of operating men all over the country, it has been possible to design a transformer that makes your specifying and buying easier . . . a simplification

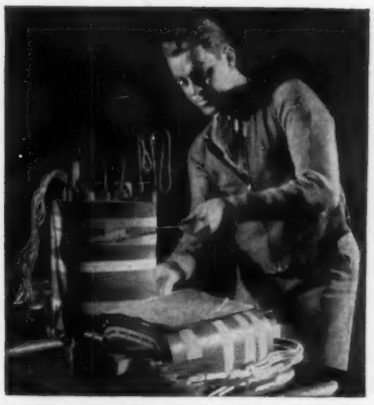
ALLIS-CHALMERS DISTRIBUTION

ALLIS-CHALMERS DISTRIBUTION TRANSFORMER



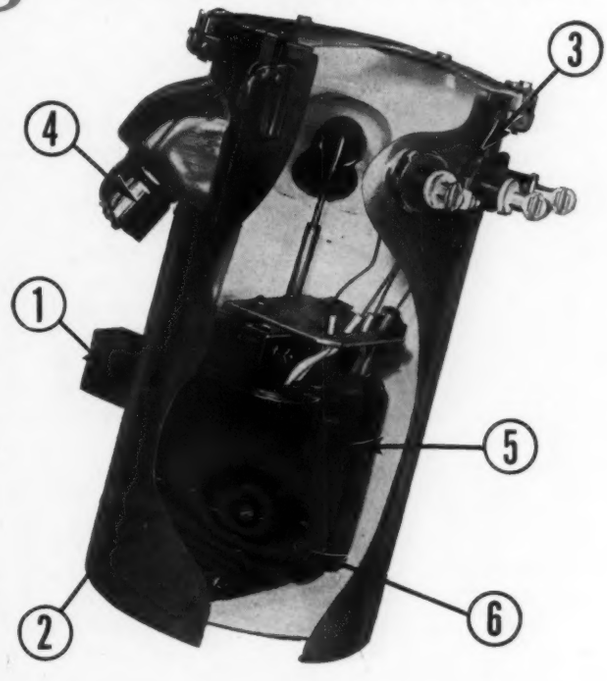
4 Extra-heavy Porcelain Coordinated Bushings with Liberal Creepage Offer Maximum Reliability Under Fog, Dust, Chemical or Other Adverse Conditions.

5 Double Conductor Insulation... Flexible Enameled Wire... Plus the Added Protection of Well-Lapped Cable Paper Provide Double Safety Against Winding Failures.



6 Improved Core and Coils, Liberally Designed with No Manufacturing Short Cuts . . . Mean Extra Years of Service-free Performance Under All Types of Operating Demands.

Engineering Features!"



that will undoubtedly save thousands of dollars, not only in first cost, but in operating expenses as well.

How is this done? By standardizing the location of supports and bushings, all sizes and makes are now completely interchangeable. This means you can get faster deliveries . . . easier installation. It also means fewer parts and fewer complete units for you to handle in stock.

Remember, too, Allis-Chalmers cuts no corners in its manufacturing process. Advanced engineering . . . plus the best material and skilled workmanship . . . give you built-in quality second to none.

For complete engineering information on the new Allis-Chalmers EEI-NEMA Distribution Transformer, call the district office near you. Or write for your copy of our new Bulletin B-6159. Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin.

A-1382

TRANSFORMERS *Cut Operating Costs*

ELECTRA'S HUSBAND

Stirrer-Uppers

"WHOLE world's stirred up into the worst mess it's ever been in," I mused aloud after reading the newspaper the other night. Electra's sharp ears heard the grumble and looked at me.

"That's hardly scientific, is it, to be so positive?" she was teasing. "How do you know for sure that it is the very worst?"

"Oh, of course, be technical." I was still irritated by the news I'd read. "What is the meaning of it all? Surely there's some sense to it."

"Just like an engineer to want to know why, but just like one not to know why, too," she grinned in feline superiority.

"All right, smarty," I reached for it, "if your so-called intuition knows, for heaven's sake tell me. I'll try to make sense out of it by applying the usual conversion factor."

"This isn't intuition, it's just knowing people," she said, "and when you know people you know that there are some who will never let others that are fat and comfortable rest on their laurels."

"I still don't get it."

"Remember that Gilbert and Sullivan operetta, something about 'every child that's born alive is either a little Liberal or a little Conservative.' The liberals are the stirrer-uppers. They never have anything much themselves but they will never let the conservatives enjoy their property and stuffy lives."

"Well, the damn liberals never know how to conserve anything, if that's what you are driving at. The conservatives do. That's why they have property. They accumulate it because they conserve."

"I know that all too well, dear, but remember the liberals, not having anything of their own, are always out to take it away from those who have. The minute a liberal begins to take an interest in his own property he isn't liberal anymore, he becomes conservative too."

The more I reflected on it, the more I saw the truth of this observation. A few evenings previous we'd been to dinner where some of the liberals of our acquaintance were present. They had been discussing the war and America's participation in it. "What we need is a definition of Britain's war aims," they declared. But when by question I had sifted down just what it was they wanted to know, it appeared to be this: Would the "English ruling classes," the property owners, give up the control of the government to the so-called people?

In arguing about it I ventured the opinion that when the war was over the people would turn naturally to the conservatives for leadership because they would have lost faith in anyone else but the solid, conserving type of people. They would need people who knew how to build and conserve after the awful waste and spoilage of war. I recalled that after the last war even Americans turned to the "back to normalcy" candidate after "inspired" leaderships.

Friends of mine moved into a house once occupied by a family of intellectual communists—after it had been cleaned up. The house was a sorry mess. Not a clean spot in the place. The garden overgrown with weeds. I can just see them, sitting around, talking, mooning over the piano instead of doing the dishes. Talking of remaking the world and not doing a thing about the ten square yards of it out front that wouldn't have been too much for them.

Every little detail of maintenance they neglected. Not only that but they seemed to have no sense of the use of things. For instance the careless bums had used the air intake grill to the furnace in the hall as a place in which to sweep the floor dust. When any piece of equipment or appliance broke down, instead of attempting to repair it, they just abandoned it. The place looked like, and was something of a dump. When it got too thick to move around, they moved and started all over again on somebody else's property.

Electra said at the time that it must be pretty hard on an engineer to see that kind of misuse of property.

Reflecting still more, I could see why it is that the property of the world, its wealth, drifts into the hands of the conservatives. They know how to take care of it. They maintain it. They are operating men. And in business we know how few good careful operators there are. It also explains why the heads of big businesses are often unimpressive, conservative men, bashful on their feet, men who avoid the public. Yet they are the heads of big concerns. It is because they know how to take care of them, to conserve their assets.

On the other hand it explains too why brilliant men, creative men, men who make a fine public speech and are good mixers, even men who build a business to its peak often are not the men to operate it. The construction engineer on a power project seldom sticks to operate it, preferring to go to a new construction job where there's more doing.

Radicals, since time began, have been the idea men. They didn't like the way things were run or made. Had to change them. They raise a lot of hell, make speeches, stir everybody up until they get their changes made or voted. But so often they are the first ones to quarrel with their own idea. Abandoned, it falls into the lap of the conservatives to operate and maintain.

Back in 1929 at the PCEA convention a talking film from England still remains vividly in memory. In it an economist, Ernest Benn, talked sensibly of private ownership of property, saying that before wealth or property could be owned it must be made; but there was a third consideration too. It must be cared for, preserved, maintained and guarded from depreciation. "The world is littered with the ruins of public works that have been discarded."

If the conservatives seem to accumulate the world's goods, they get them largely by default from the previous generation of stirrer-uppers. I suppose they hold them until the next generation of radicals comes along to stir up and take away to share the wealth again. It doesn't seem to make much difference what labels are plastered over the redished-up social or economic system—feudalism, capitalism, socialism, fascism, communism or nazism—when the stirrer-uppers get tired, or what is more likely to happen as it did in Russia, can't be trusted to run the very system they inaugurate, then the conservatives get it back. I've seen it happen in labor unions, in lodges, and it happens in nations too.

"Wonder if that's what the Carpenter of Nazarene, himself thought to be a bit radical in his day, meant when he said, 'Blessed are the meek, for they shall inherit the earth.' "

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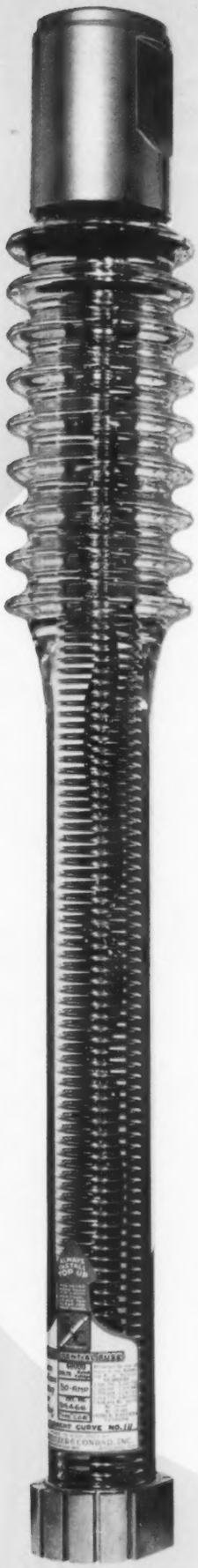

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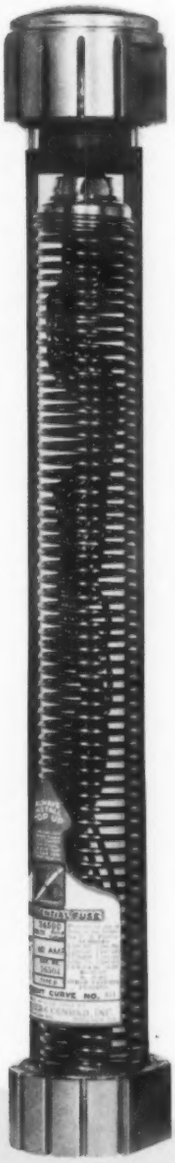

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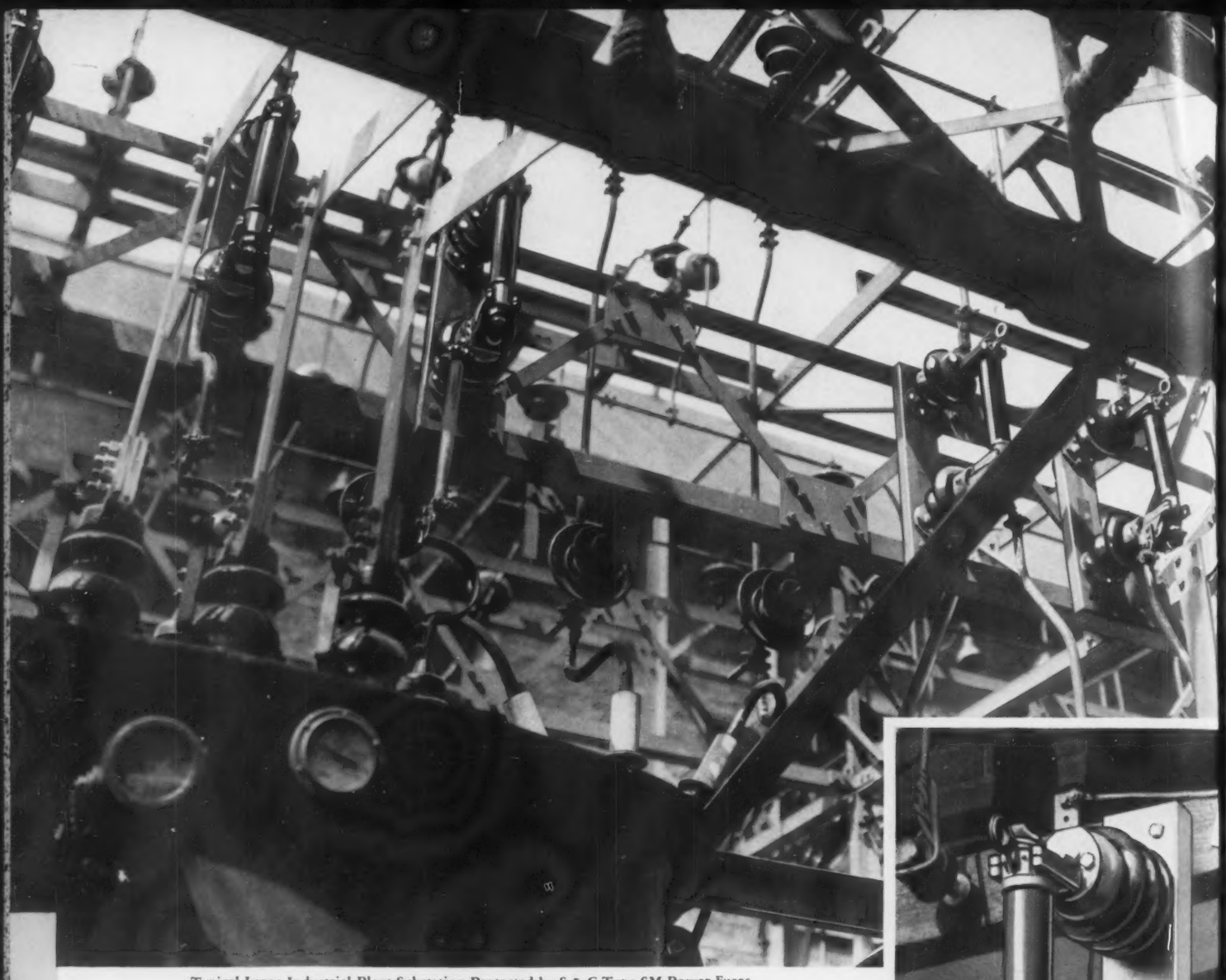

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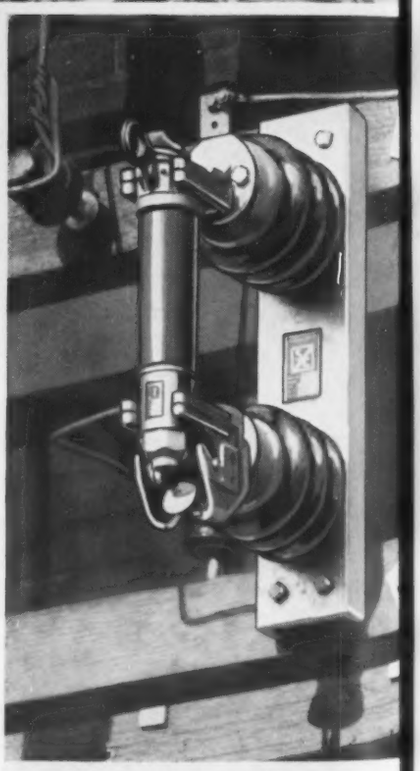

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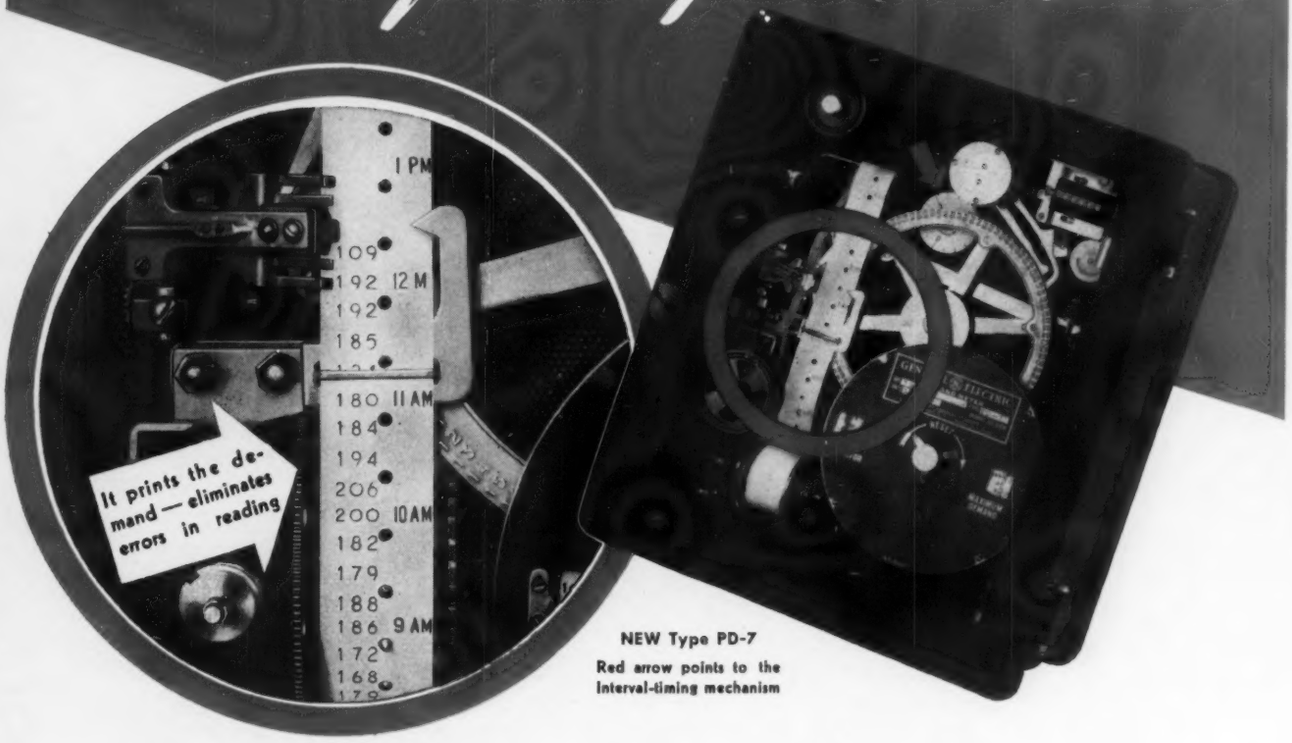

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Red arrow points to the interval-timing mechanism

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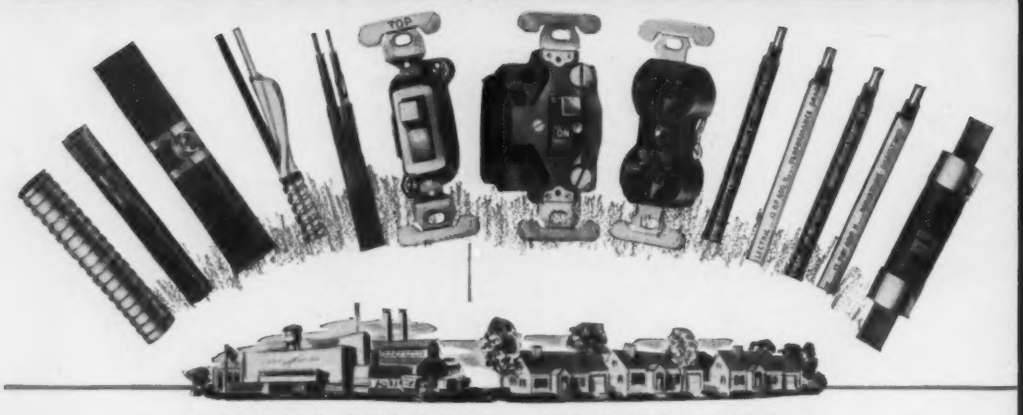

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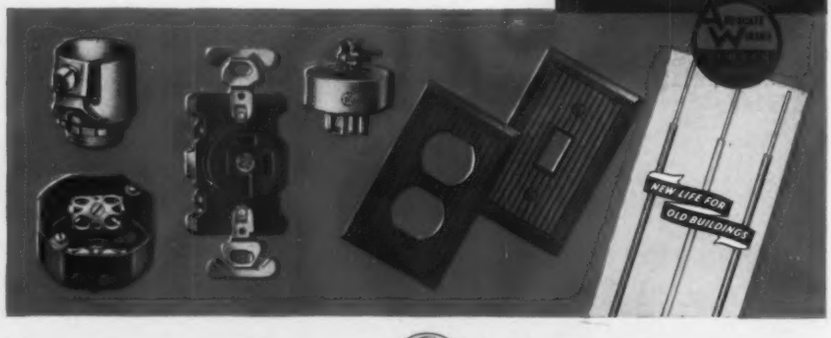

GENERAL ELECTRIC

ELECTRICAL WEST

MAY 1941
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In *Union* There Is *Strength* . . . .

★

A plea for unity in the power picture of the Northwest so that the public may obtain the maximum benefits from Bonneville and Grand Coulee power

By Kinsey M. Robinson*
President, Washington Water Power Co.

IF present attacks on the electric utility business are successful this phase of private enterprise is eliminated entirely through socialization of the power business in the Northwest . . . none can say what other industry will be next. We who believe in private enterprise, all are in the same boat. It just happens that it is the public utility industry which is under fire now, and some in the government would take us over bag and baggage, without any regard for the wishes of the people in this area. The same perils and the same problems of federal control are right at hand for all industry today.

A number of years ago, the federal government embarked on a broad program of power production in the Pacific Northwest. Two huge generating projects, at Bonneville and Grand Coulee, assure an adequate supply of electricity for years to come. They herald a new power era, and they can be made to mean much to the ultimate development of this region.

Completion of these projects, however, does not in itself assure the maximum development. The problem of transmission and distribution of power from them remains to be solved. Those of us who have spent our life in the utility industry, believe that through a sincere program of *coordination* and *cooperation* between governmental agencies and the existing publicly and privately-operated utilities, electricity from these giant plants can be brought to the ultimate consumer in such a manner as to assure the greatest utilization of electricity, with the lowest cost and the highest standards of service.

In spite of the fact we have repeatedly and publicly offered such cooperation, nothing has been done about it by the government. Instead its program has veered even further away from coordination and cooperation.

Principal problem confronting the people of the Northwest today is how to formulate and put into operation policies which will bring the maximum benefit of Bonneville and Grand Coulee to the greatest number of people.

An important resource of the territory is its large proportion of the nation's water power. There are more than 280 privately-owned and operated generating stations, large and small, with installed capacity of some 2,250,000 kw. This is in addition to *public* power projects, including Bonneville and Grand Coulee, whose capacities will be doubled by the end of this year. The capacity of the plants in this area always has been well above its demands.

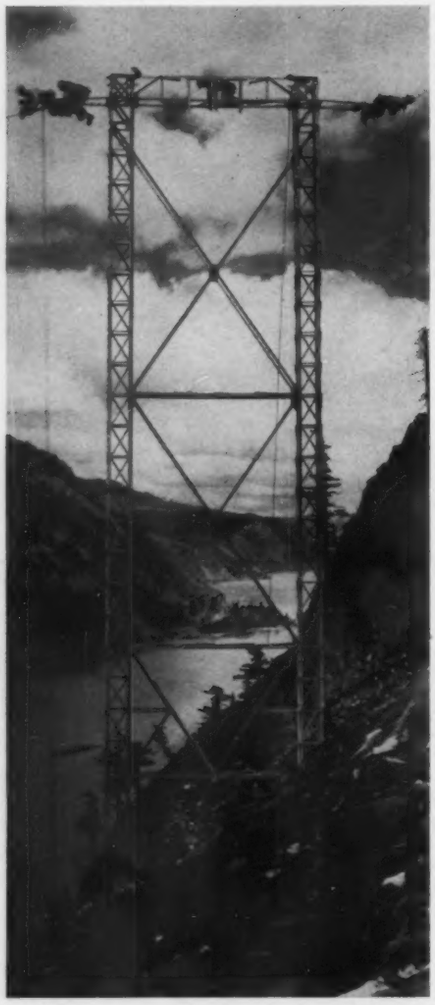
Let me trace briefly the growth of the transmission network of the electric industry in the Northwest, presenting my views of how it can work with the government in bringing the maximum benefit of low-cost power from these tax-free, federally-subsidized. projects to this large area with the least loss of time. The private utilities are not opposing installation of additional generating facilities at Bonneville and Grand Coulee.

Throughout these five states . . . from the Pacific coast to eastern Montana and Utah, from the Canadian border to northern California . . . stretches an interconnected network of privately-owned power transmission systems which has enabled the industry to meet every demand or every emergency. This integration of power facilities began back in 1908. Some of the first such systems in the country were right here in the Northwest, which also saw the earliest development, of hydro-electric power. By the time of the last world war, those interconnected systems had grown in mileage and scope, expanding through the years in advance of the growth of the country. Through all the years, the Northwest maintained a position of leadership in this development through the initiative of private enterprise.

Prior to 1933, the federal government had not built any high tension transmission lines. Neither have municipally-owned systems contributed substantially to this interconnection, which takes advantage of varying load requirements of agricultural areas, mining regions, industrial centers, and cities and towns. Through this system, these uses are "leveled out" and the various companies get a greater use of their facilities. This has contributed substantially to the low electric rates that have always existed in this area.

The operation of this great Pacific Northwest electric transmission grid can be coordinated with those of Bonneville and Grand Coulee to bring the benefits of these projects to *all* the people . . . more quickly, and at lesser expense to the nation, than by any other means!

* Extracts from an address before the Pacific Northwest Advisory Board, Portland, Ore., March 28, 1941.



"I do not believe that the government should needlessly duplicate existing transmission facilities which are adequate to handle this government power."

There is room in the Northwest for *both* public and private power, with these huge, federally-owned projects generating vast amounts of electricity and transmitting it over existing lines, where they are adequate, or newly-built lines, if necessary; leaving distribution of that power to private companies or public bodies already in existence. I do not believe that the government should needlessly duplicate existing transmission facilities which are adequate to handle this government power.

The private companies have many times publicly signified their willingness to cooperate with the federal government in distributing Bonneville and Grand Coulee power the day it is available, passing all resulting savings along to their customers. As a matter of fact, that was the expectation of the people of the Northwest when these projects were begun.

There is absolutely no need for government destruction of privately-owned companies and the resultant loss of more than $17,000,000 annually in taxes. Cooperation will greatly reduce the amount of money needed for transmission facilities, and technically-trained men and vital construction materials can be released to support the nation's defense program. Government money can and should be used for production of planes and ships, barracks and bombs, guns and essential defense supplies which necessarily must be financed by government.

By concentrating government spending and energy—its men, money and materials—on the nation's number one problem of national defense, a greater degree of protection will be furnished for our country.

These are times that call for the closest cooperation between government and business, and the utility industry is giving and will continue to give that cooperation. Industry's part in this new national unity must be to offer itself promptly and without reservation to the national service. Government's contribution could well be to turn from an attitude of dislike and distrust of business and a policy of drastic and detailed direction of the nation's industrial life, to new methods of cooperation and coordination. Waste of money, men or energy should not be tolerated.

Relying on the spirit of cooperation outlined in Mr. Roosevelt's Portland address, the private utilities have not increased the size or the number of their generating plants since it became apparent these federal projects were going to be built. Through operating economics and an increased use of electricity that is far ahead of the rest of the nation, these companies have been able to carry out consistent rate reduction programs which will extend into the future unless inflation, extraordinary defense taxes, or other uncontrollable factors prevent.

Rather than have power from Bonneville and Grand Coulee used to take away the present business of the private companies, creating the economic waste of idle power plants and dead transmission lines, this power can and should be used for the real purpose of these projects—to get the fullest use of electricity over the greatest possible area of the Northwest, to reduce the cost of service to present users of electricity, and to help develop new industries and new payrolls for the region. This, together with reclamation, the original purpose of the Grand Coulee project, will stimulate the prosperity and progress of the entire territory.

Coordinating the public plants and the private systems is simple. There is no real reason why they should not be so operated, cooperatively, for the benefit of all. Here in the Pacific Northwest are two huge tax-free federal power projects which soon will have tremendous blocks of power for sale. And here are twelve large privately-owned power systems, 280 or more power plants, 16,000 miles of transmission lines, nearly 13,000 employees, and an annual payroll of some $24,000,000. These companies have expended more than $72,000,000 for new construction in the last five years.

On the basis of sound economics, the practical solution is a pooling of power from the government generating projects with power from the existing systems, keeping the 280 plants in operation, thus utilizing to the greatest extent the water storage facilities of these systems. This will not only prevent waste and destruction of investment but also will materially increase the firm—or full-time—output of the combined system.

Such a program would obviate needless expansion of government facilities and would require only a fundamental "backbone" transmission grid to carry power into the major load centers of the Northwest. From those load centers, our present interconnected transmission systems are well developed, and we can transfer substantial amounts of power to make up any deficiences which might arise in other parts of the interconnected systems. There is no need for using dollars obtained through taxes to build expensive duplicating federal transmission lines.

This program would permit private companies to continue their original useful purpose, instead of destroying them *for no constructive reason.* This idea of cooperation is not new. It is an arrangement similar to that now in effect between other government projects and privately-owned utilities in Arizona, Texas, Nebraska, Tennessee and elsewhere. Since such cooperation has been accomplished in other places to the benefit of the areas involved, why shouldn't it be attained here?

Had the government not assumed the job of building generating facilities in the Northwest, the private companies would have continued to build in preparation for the future as they have done in the past. The private utility industry *always* has maintained reserve transmission facilities throughout the Northwest to meet future needs of the various parts of the territory.

Now let's examine the purpose of these federal projects . . . in the light of the language of the act creating the Bonneville Power Administration. In that act, Congress instructed the administrator of Bonneville to build a system, the purpose of which was "*to encourage the widest possible use of all electric*

energy that can be generated." Electricity from the Bonneville-Coulee projects can be sold, under the act, to private utilities, provided preference and priorities are given to public bodies and cooperatives.

From the standpoint of public policy and achieving the goal of encouraging "the widest possible use" of electricity, there should be an immediate coordination of these projects and the privately-owned power facilities. It is certainly more important that residents and industries of the Pacific Northwest receive Bonneville-Grand Coulee electricity at the lowest possible rates *right now* than it is to withhold a large part of their possible power output until ultimate determination of whether this power shall be distributed through public or private agencies. And, likewise, it is important that industries be free to grow, and to locate in *all* parts of the region; not merely beside federal plant locations which are being developed by moving of all new industries to these locations.

Why not use the facilities now available in the region, instead of waiting to build a superimposed, independent, transmission system over the top of the transmission systems now in the territory, and leading to exactly the same load centers and the same markets now receiving service? They know how to do the job and keep on doing it. Other organizations need not be sidetracked from defense projects to do this job.

There is no question but that these centers will be the same principal markets which will exist for a number of years to come, except in the case of further specialized large industries which will unquestionably be attracted to the Northwest. These present markets are the logical centers of population.

Let's list the groups most concerned in this program of bringing electricity to consumers of all kinds at the lowest possible cost. There is the federal government, which built Bonneville and Grand Coulee. There are the publicly-owned systems such as Seattle, Tacoma, Eugene and a few small operating public utility districts. There are the regulatory commissions of the various states of the Northwest, the privately-owned utilities which now are on the job and the prospective additional large industrial customers buying power direct from Bonneville-Grand Coulee. Then, too, there are the groups interested in the specialized problems of irrigation and rural electrification and finally, the homes, stores and shops all over the region.

It is my suggestion that this whole matter of power supply, including rates and methods of distribution, be studied immediately by an impartial, fact-finding committee guided only by rules of sound public policy . . . not by partisanship on the question of *public* versus *private* ownership. On this committee could well be representatives of the federal government, state regulatory bodies, existing publicity-owned systems, industry, labor and the private power companies; in fair representation in each case, and with due regard to "home rule" and to the importance of local needs, conditions and ideas.

It must be recognized that a new power era is here. With this era has come a definite responsibility to the government and to the utility industry to present a definite plan through which benefit of these projects—built with the taxpayer's dollars—can be brought to the public as *soon* as possible, and as *effectively* as possible. This is a problem in the last analysis, for the Northwest itself to solve, a localized problem requiring the best efforts of all concerned.

Certainly a Northwest fact-finding committee should conduct this kind of a review before any permanent legislation is considered by Congress. Legislation without proper consideration, could prove to be very detrimental to the best interests of the people who must continue to live in this area. These are the people, after all, who must pay back to the federal government, with interest, the cost of that part of those tremendous projects allocated to power.

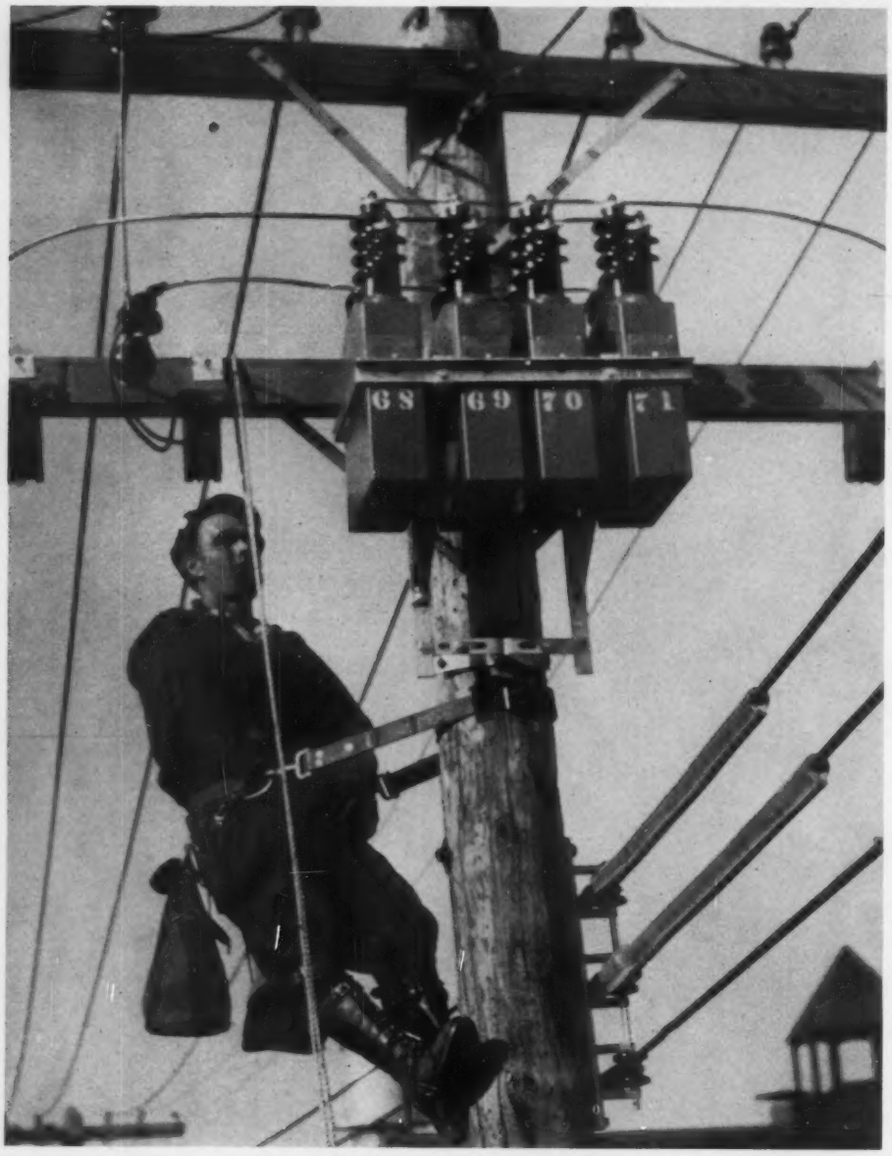
I am sure the Northwest is grateful to a benevolent government which has invested the hundreds of millions of dollars necessary to build these dams, which could not have been done by anyone else. But I am also sure that the people of the Northwest are ever-mindful of the fact that the crying need of this region is more taxable property to produce tax monies with which to operate the tremendous areas of these five states, which already have so great a percentage of their property off the tax rolls because of ownership by the federal government. The fact that the national government has poured these millions into these two gigantic multiple-purpose projects is not justification for any arbitrary handling of the problems created by their construction.

The people of the Northwest are by no means unanimous in their views on public ownership, although I believe they *are* united in their support of Bonneville and Grand Coulee, now that they have been built. That many of our citizens will not have public ownership thrust upon them was demonstrated March 11, in Spokane, largest city in the Grand Coulee area, which decisively rejected public ownership for the second time in four months; and last May, when the citizens of Portland, largest city in the immediate vicinity of Bonneville, also rejected public ownership. But I am sure these refusals of the principle of public ownership were not a rebuff to the government power projects. Instead, these decisive votes meant Spokane and Portland felt this power should be distributed through existing facilities, provided reasonable rates were assured.

The real sentiment of the majority of people most directly concerned could be determined by an impartial fact-finding committee.

I hope that consideration will be given to this proposal in an open, fair-minded way . . . and that the bickering over *who* shall distribute the power can be ended. Such controversy never builds, it always tears down. The greatest benefits of cooperation cannot be measured. Cooperation and harmony, instead of duplication and discord in the power field, will advance prosperity and progress for the entire area. The Northwest has an enviable record as a community of builders, and the power question should be approached just as we would approach any other common problem which affected the five states of this region.

"Two huge generating projects, at Bonneville and Grand Coulee, assure an adequate supply of electricity for years to come. They herald a new power era, and they can be made to mean much to the ultimate development of this Northwest Region."



Figuring for Series Capacitance

By L. M. Applegate and R. F. Erb

Bonneville Engineering Staff

How to arrive quickly at the advisability of using series capacitors for regulating distribution circuits. Directions for the Mershon method and a quick procedure for close approximation. Tabulations of comparative regulating costs

A GENERAL view of the problem of applying series condensers to distribution circuits can be had by examining the problem specifically for common ranges of voltage, conductor sizes, loads, and power factors. Costs computed on conditions which are assumed to be representative of ordinary practice can be compared informatively with the cost of step, or induction regulators of comparable regulative effect. When computed for a practical range of operating conditions, cost and performance data in tabular and graph form provide a convenient and reliable basis for estimating cost and performance under comparable conditions elsewhere.

The calculation of capacitor requirements for an assumed situation is not a difficult matter once it is fully understood. It is easily accomplished graphically with the ordinary Mershon diagram. The vector relationships concerned are illustrated in Figs. 1 and 2, which show, respectively, the vectors for a simple circuit without and with series capacitors. In Fig. 1, using line current I as a reference vector, the IR and IX_L drops, in phase and in quadrature respectively with I, are added vectorially to the load voltage E to produce the sending-end, or generator voltage, E_G. In Fig. 2, a series capacitor X_C produces a drop IX_C which, being 180 electrical degrees displaced from IX_L, introduces a leading component of line drop. If IX_C is sufficiently large, the effect of IX_L can be completely neutralized and the resultant generator voltage E_G can, under suitable conditions, be as small as E. This is illustrated in Fig. 2. The line drops in both figures are exaggerated for clearness.

The introduction of X_C into the circuit results in a displacement of E_G from its original position to one less displaced from I, and a consequent reduction in magnitude of E_G. In the diagrams, θ is the load power-factor angle and θ' is the sending-end or generator power-factor angle.

The calculation of X_C to compensate for a prescribed line drop by use of a Mershon diagram* is illustrated in Fig. 3. For an example: Assume a line operating with a load power-factor of 0.85, an inductive reactance drop of $IX_L = 7.5\%$ and a resistance drop of $IR = 4.9\%$. The calculation to accomplish complete compensation of line drop is (noticing that the Mershon diagram is prepared with IX_L and IR in percentages of the receiver voltage at indicated power-factors) as follows:

For discussion of Mershon diagram see "Alternating Currents" by C. E. Magnusson, 4th Edition, pp. 504-508, or other electrical texts.

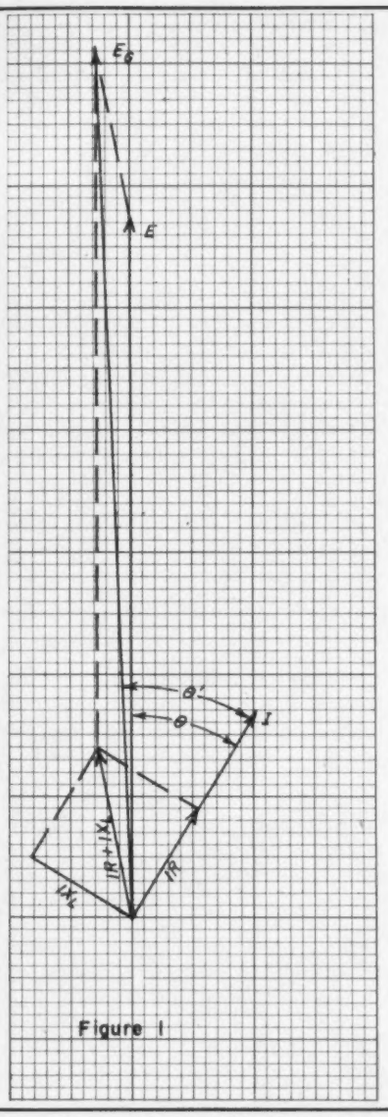


Figure 1

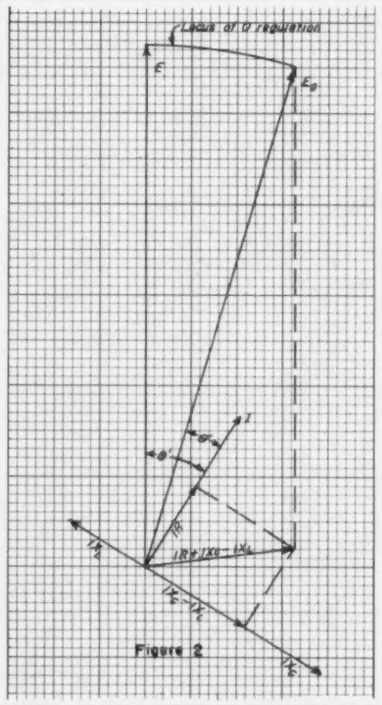


Figure 2

Starting at the X-axis at the given power-factor, follow the ordinate until it intersects the OB circle. From the point of intersection A lay off along the coordinate parallel to the X-axis, the resistance drop in percent. From point B lay off on the ordinate upward the reactance drop in percent. From point C scale the ordinate downward to its intersection at point D with the OB circle. This scaled value, the distance from C to D, is the percent capacitance voltage necessary to correct to zero regulation. In this assumed problem the value of IX_C is 16.5% of 2,300 volts or 379.5 volts.

The capacitive reactance required to reduce regulation to zero can be computed analytically from the following equation:

$$E+IX_L(\sin\theta+j\cos\theta)+IR(\cos\theta-j\sin\theta)-IX_C(\sin\theta+j\cos\theta)=E[\cos(\theta-\theta')\pm j\sin(\theta-\theta')]$$

or

$$E+E_{XL}(\sin\theta+j\cos\theta)+E_R(\cos\theta-j\sin\theta)-E_{XC}(\sin\theta+j\cos\theta)=E[\cos(\theta-\theta')\pm j\sin(\theta-\theta')]$$

Where E = load voltage
I = line current
R = line resistance
X_L = line reactance
X_C = capacitor reactance
θ = load power-factor angle
θ′ = generator factor angle

In the problem from which the data used in connection with Fig. 3 were derived, the load voltage E is 2,300, I = 133 amp., length of line 2 mi., X_L = 1.292 ohms, and R = 0.84 ohms. $E_{XL}=IX_L=7.47\%$ of E, $E_R=IR=4.86\%$ of E. $E_{XC}=IX_C=(5.78)(X_C)\%$ of E.

Expressing all voltages in percent of the load voltage with load voltage as 1 and substituting in the above:

$$1+.0747(.527+j\ .85)+.0486(.85-j\ .527)-.0578X_C(.527+j\ .85)=1\ \text{cjs}(\theta-\theta')$$

$$1.0807-.0305X_C+j(.0379-.0491X_C)=1\ \text{cjs}(\theta-\theta')$$

The quantities on both sides of this equation describe the magnitude and direction of the same vector E_G. Each side has an unknown factor: X_C in the left member and the value of cjs(θ − θ′) in the right member. Since the magnitude is the same, the square root of the sum of the squares of the cjs factors must be equal.

Therefore:

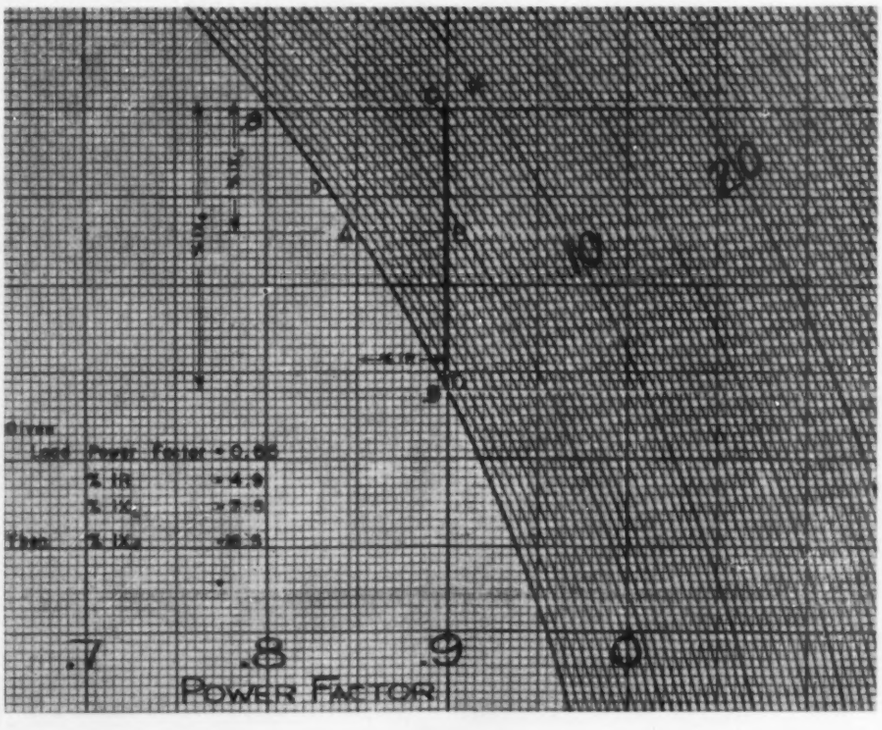
$$\frac{2}{1.0807-.0305X_C}+\frac{2}{.0379-.0491X_C}=1$$

Solving for X_C

$X_C = 2.815$ or 17.88

The existence of two values of X_C may be understood in reference to Fig. 2 or 4, in which the locus of the sending-end voltage, restricted in

Fig. 1—(Left above) Vector relations on an unregulated distribution circuit (schematic). Fig. 2—(Left below) Same as Fig. 1, but with the addition of series capacitance. Fig 3.—(Right below) Typical solution of Mershon diagram for percent capacitance voltage needed for zero regulation.



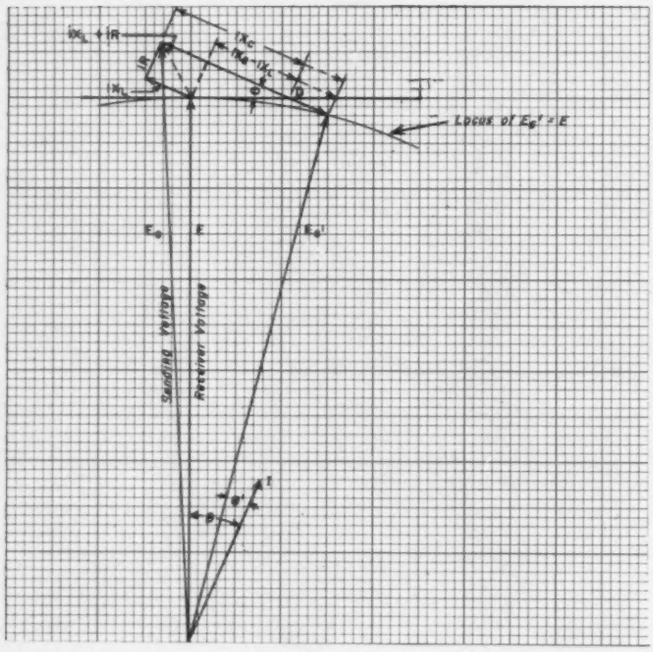


Fig. 4—Graphic representation of a typical problem: 12,470 volts; No. 6 wire; 3.5-ft. spacing; 20 mi.; 26-amp. line current

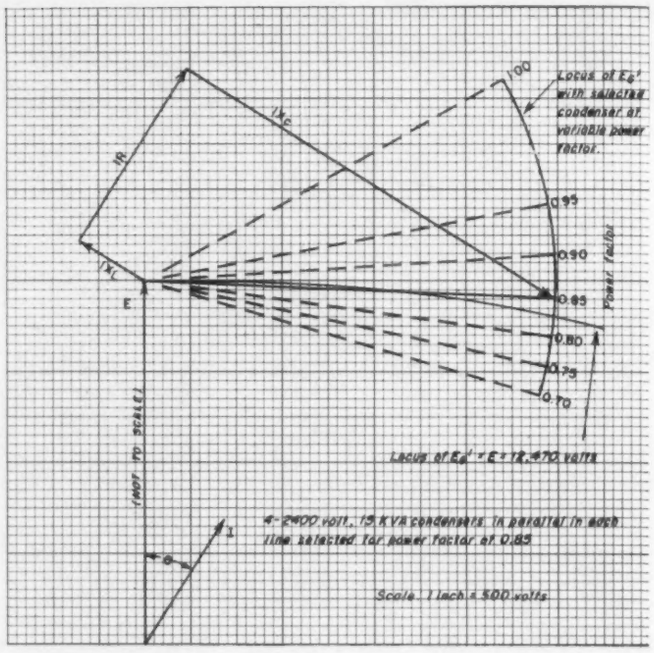

Locus of E_G' with selected condenser at variable power factor.
Power Factor
Locus of $E_G' = E = 12,470$ volts
4-2400 volt, 15 KVA condensers in parallel in each line selected for power factor of 0.85
Scale: 1 inch = 500 volts

Fig. 5—Vector relations on a distribution circuit, showing geometry permitting simplification in estimating capacitance

absolute magnitude to that of the receiving-end voltage, is represented as the arc of a circle with the value of the sending or receiving-end voltage as the radius.

A very simple method of estimating the capacitive reactance with an error that is ordinarily less than 10% with power factors less than 0.95, is as follows:

Referring to Fig. 5, the receiving voltage E together with the line-resistance drop IR and the inductive-reactance drop IX_L without any series capacitance produces uncorrected sending voltage E_G. The addition of series capacitance necessary to correct the voltage E_G to $E_{G'}$ equal in absolute magnitude to E, produces a voltage IX_C added to the line impedance drop and terminating at the sending voltage circle.

The length of the vector IX_C is approximated by a shorter vector terminating at the point D on the tangent to the constant voltage circle drawn through the terminus of receiver voltage E. This construction is shown in Fig. 5. With this geometrical simplification,

$$\frac{IR}{IX_C - IX_L} = \tan \Theta$$

from which:

$$IX_C = IX_L + \frac{IR}{\tan \Theta}$$

It will be noticed that the value of IX_C obtained from this equation will always be less than the true value of IX_C. This will result in the estimate of a lower capacitive-reactance voltage than is actually necessary for holding $E_G = E$.

However, the error being usually less than 10%, a reasonable allowance for variation from the assumed voltage conditions will provide the necessary factor of safety in the selection of capacitors of proper voltage. Making such an allowance, the approximate method will give an adequate estimate of cost inasmuch as it indicates a condenser capacitance in excess of actual requirements. Where power factors and load conditions are not known precisely, this method of computing condenser requirements could be fully satisfactory, providing the power factor were not more than 0.95.

After determining the value E_C, the next step is to determine the condenser with the voltage and current capacity adequate to meet the requirements of the problem. The commercial sizes of condensers are rated in voltages in steps of 230, 460, 575, 2,400, etc. It is necessary to choose a condenser with a voltage that will be equal to or in excess of E_C. This may be accomplished by connecting condensers in series to approximate any value of E_C.

The other factor in the selection of the condenser is the current capacity. After selection of a condenser with a given voltage there will be two or three different current capacities available for this voltage. The expected load determines a given line current and the condenser bank must have a current rating corresponding to the line current. The number of condensers connected in parallel to secure this rating in each line is obtained by dividing the line current by the current capacity of the individual condenser at the given voltage. It may be necessary to connect two or more condensers in parallel to obtain this capacity.

The selection of a certain condenser entails the assumption of a load power factor. In Fig. 4, this value was assumed to be 0.85. The diagram shows the effect of the condenser selected when the power factor is other than the assumed value.

In selecting condensers it is found that different combinations of various sizes will accomplish the same purpose. In such cases it is obvious that the cheaper combination, all other conditions being equal, would be used. A study of price data indicates that the cheapest condensers are in the 2,400 and 4,160-volt classes with cost per kva. increasing for lower and higher voltages. It will also be found that it is seldom that a particular combination of condenser will exactly make the value of E_G equal to E and that E_G will be greater or smaller than E.

An estimate of the cost of different sizes of condensers as of November 1, 1940 is as shown in Table I.

Table I—Capacitor Costs

Volts Rating	KVA Rating	Cost
230	5.0	$ 82.50
230	7.5	115.00
460	10.0	82.50
460	15.0	115.00
575	10.0	82.50
575	15.0	115.00
2400	10.0	74.00
2400	15.0	86.00
4160	10.0	74.00
4160	15.0	86.00
4800	15.0	119.00
7200	15.0	119.00
12,470	15.0	160.00

In preparing the cost charts in Fig. 6, the selection of condensers followed the above procedure. A condenser was first chosen that met the voltage requirements and the size of condenser necessary to carry the line current at this voltage was then determined. This method resulted in some cases in selecting either more condensers or condensers with larger capacity than may be found necessary. However, following this procedure, the results obtained are conservative.

Example:

In the problem calculated earlier, the value of IX_C obtained was 379.5 volts. The nearest voltage rating for condensers is 460 volts. A 460-volt, 15-kva. condenser has a current capacity of 32.6 amp. The line current in the above problem was 133 amp. Therefore, the number of condensers at this rating is 133/32.6 or 4+ condensers in parallel. The capacitive reactance of this size condenser is 14.1 ohms. Using 5 condensers in parallel, the equivalent reactance is 14.1/5 or 2.82 ohms and $IX_C = 133 \times 2.82 = 375$ volts. This compares favorably with the value of IX_C required of 379.5 and the value of E_G would be very close to the value of E.

An installation of series capacitors must be protected when capacitors are installed with voltage ratings very little in excess of their normal working voltages. There are usually four conditions which must be considered:

(1) Full line current; (2) Momentary overload current such as occurs during motor starting; (3) Continuous overload current; (4) Maximum short circuit current.

Capacitors are allowed a maximum continuous voltage 15% above rated voltage. It is desirable, therefore, to prevent the operation of the series capacitor at more than 115% of its current rating.

It is permissible for the voltage across the capacitor terminals to reach a momentary maximum during motor starting of 150% normal rated voltage. The protective device should, therefore, permit the capacitor to operate for a few minutes over the range of 115-150%.

The capacitor must be shunted out in case of a short circuit on the line. A protective device used for protecting the capacitor during short circuits on the line should be one that is extremely fast and capable of handling the current for the duration of the fault. No mechanically operated switch is fast enough to protect the capacitor for the first cycle or two, therefore, some kind of gap arrangement is required to give the first protection in the order of micro-seconds that will not permit the voltage on the capacitor to exceed between 2 and 2½ times its normal rated voltage. A switch may be associated with the gap to by-pass it and relieve it from carrying the short circuit current after the first few cycles.

In preparing the cost charts in Fig. 6, the cost of the protective devices was estimated as being $300 in each case.

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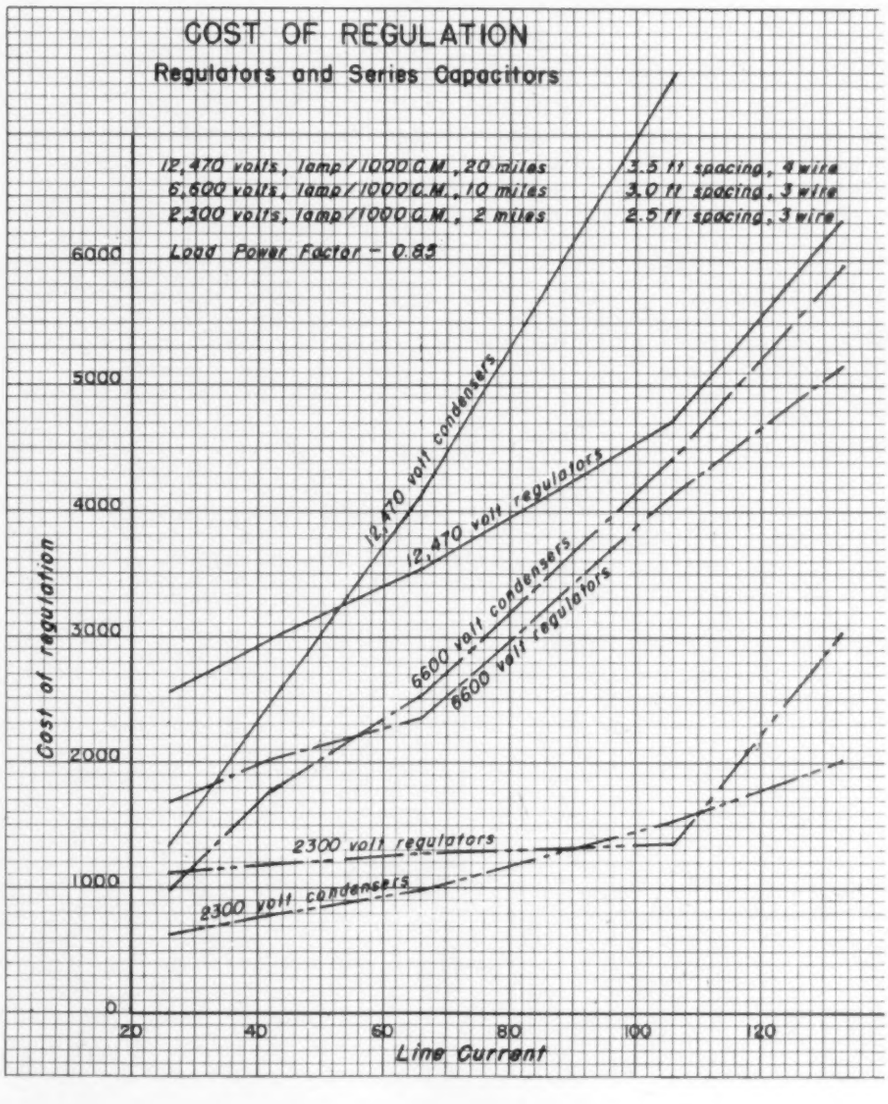
Fig. 6—Comparative costs of regulators and series capacitors for various voltage and line currents



Modern Methods of Testing Watt-Hour Meters

By C. N. Teed
Idaho Power

Stroboscopic and photo-electric techniques in meter testing have increased both accuracy and efficiency. Several Northwest utilities have advantageously modified existing equipment to fit needs and secure advantages of these methods

THE comparatively recent introduction of stroboscopic and photoelectric devices for use in testing watt-hour meters has made some interesting tools available to the electrical utilities. How do they work and how well do they work are questions that are no doubt in the minds of many meter department superintendents. An attempt will be made to answer these questions, based on the experience of several Northwestern operating companies.

These two entirely dissimilar types of equipment are, to the knowledge of the writer, exemplified by three different devices, each of which will be considered in turn.

The Westinghouse Strobometer, as its name implies, utilizes the well known stroboscopic principle whereby a rotating object, if illuminated by intermittent flashes of light, will appear to be stationary if the intervals between the flashes are equal to the rate of rotation. If the rotating object is moving slightly faster than synchronism with the flashes of the light source, it will appear to rotate slowly in its direction of rotation. Conversely, lower speed will result in apparent rotation in the opposite direction.

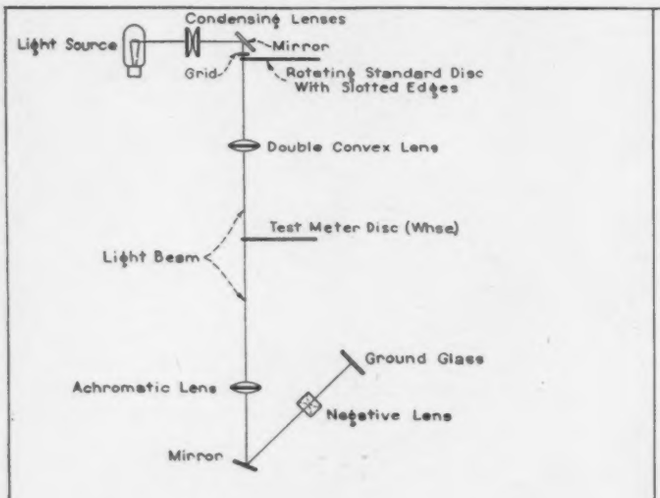
As the testing of watt-hour meters consists essentially of comparing the rotational speed of the disc of the meter under test with that of a standard watt-hour meter, the stroboscopic principle is adaptable to meter testing. One modification is necessary, however, due to the relatively low rotational speed of a watt-hour meter disc, even under full load conditions. By using stroboscopic illumination in the usual way, that is, one flash of light per revolution, a flash frequency far below the rate of persistence of vision would result. Hence, meters are tested with 400 flashes per revolution of the meter disc. This corresponds to the basic number of notches on the periphery of all notched meter discs referred to a watt-hour constant of 1/3. Consequently by observing the edge of the disc of the meter under test the notches will appear to progress slowly forward or backward if the meter is out of adjustment. The stroboscopic light is provided by interrupting a light beam by slits in the edge of the disc of the rotating standard.

Fig. 1 is a schematic diagram of the optical layout. As it would be inconvenient to determine the "as found" accuracy of the meter by the rate of apparent motion of the disc, a potentiometer is provided which independently adjusts the potential applied to the standard watt-hour meter. The potentiometer dial is calibrated in percent, so a setting that results in no apparent motion of the meter disc reads directly in percent accuracy. A tapped current auto-transformer is provided in order that a single rated standard may be used with any rating of meter. Adapters are supplied for testing either socket type meters or indoor type. The basic socket is provided with slotted mounting holes to permit the slight adjustment required to position properly the edge of the disc in the light beam.

Three of the four Northwestern companies reporting operating experience with Strobometers state that they have found it desirable to incorporate minor modifications to better fit their needs. These include:

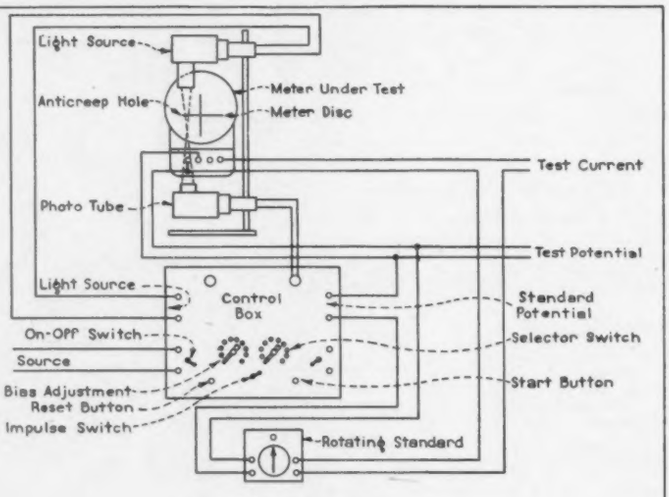
1. Installation of a crank-driven worm adjustment for horizontally positioning the meter disc.
2. Improved hanger to facilitate verti-

Fig. 1.

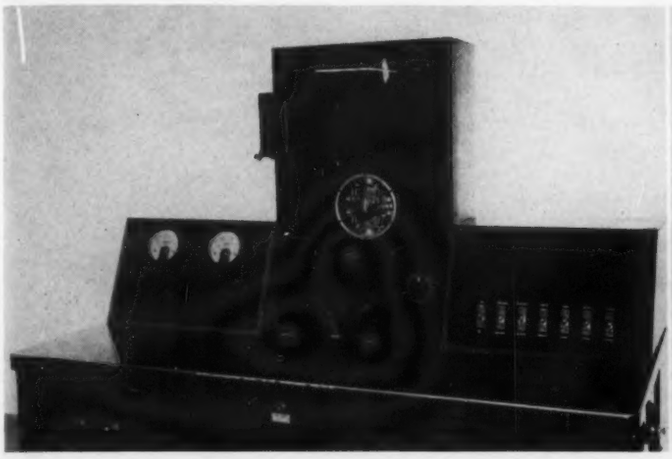


OPTICAL LAYOUT OF STROBOMETER

Fig. 2.



SCHEMATIC DIAGRAM OF PHOTOELECTRIC METER TESTER



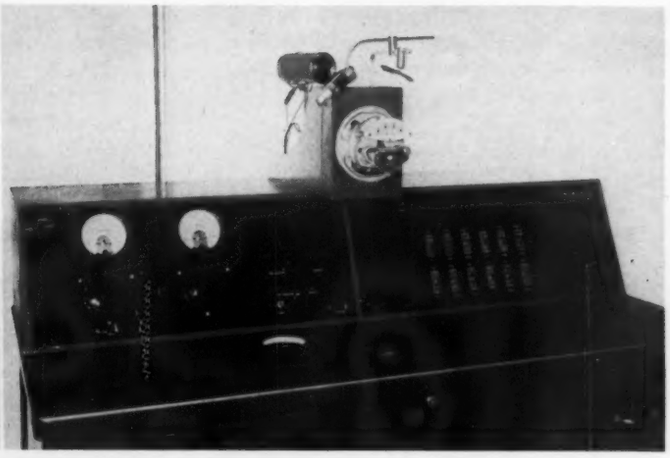


Fig. 3. (left)—View of Modified Strobometer using Key Switch Control

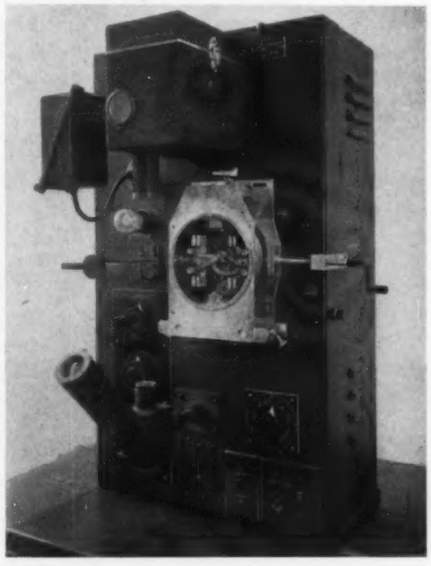
Fig. 4 (right)—View of Built-up Photo-electric Meter Tester operated with light reflected from disc.

cal adjustment of the motor position.
3. Installation of a mirror above the rotating standard and a potential start-stop switch to permit testing of meters not having notched discs.
4. Improved ventilation of lamp housing.
5. Installation of a 120-volt neon glow lamp for a ground indicator.
6. Two of the companies have provided rather similar loading devices whereby a manual rotary switch is set to the meter rating and a second rotary switch selects "Full Load," "Light Load," and "Creep," and a double throw toggle switch selects the desired power factor. The third company uses a dead front panel fitted with light key switches, which in turn control relays, to select the various loadings and power factors.

The stroboscopic method of testing meters was put in use some ten years ago by Westinghouse for large scale testing operations. About five years ago it was placed on the market for use in the meter department of operating companies. The four Northwestern companies that report operating experience with this device are unanimous that the "Strobometer" has proven to be entirely practical and economically worth while. All four companies report time savings, ranging from 30% to 50%, with an average, including both old and new meters, when stated, at 36% as compared to the familiar manual start-stop method. Using this average percentage figure applied to present manual meter testing costs, it should not be difficult for a meter department to determine whether or not stroboscopic equipment can be economically used in their own operations.

Three out of the four companies reporting operating experiences have directed mild criticism at this type of equipment. One company reports that occasionally meters are encountered which do not have clean cut notching on the disc which results in a blurred image. Two other companies expressed the opinion that the principal shortcoming of stroboscopic testing was the fact that it is necessary to observe one complete revolution of the meter disc during the light load test on account of the disturbance of the disc motion due to the anti-creep holes. On account of having to observe one full disc revolution it requires somewhat more time to make the light-load test than that for full load. One company reported that meter testers complained of eye strain due to an excessively bright image. This was corrected by mounting one stationary and one movable polaroid disc in the viewing tube. By rotation of the movable polaroid disc the brightness of the image could be reduced any desired amount to suit the individual tester.

Fig. 5 (below)—View of Modified Strobometer using Manual Rotary Loading Switch



In summation, the following conclusions appear to be justified:

1. The merit of stroboscopic testing is especially outstanding in testing new meters prior to being placed in service.
2. To secure fully the advantages of stroboscopic testing the testing routine should be so arranged that the operator can obtain and dispose of the meters being tested without leaving his seat, and all incidental work should be done by assistants.
3. Meters to be tested should be grouped as to type and rating to avoid lost time in readusting the base mounting for different types of meters.
4. Stroboscopic meter testing considerably reduces the personal equation in comparison with the start-stop method.
5. The characteristic apparent motion of the disc resulting from various types of friction can be recognized by an experienced operator, and this gives an immediate clue as to proper corrective measures.
6. The "Strobometer" is a practical, workable device and should be seriously considered by any meter department where the volume of testing of meters having notched discs is fairly high.

NORTHWEST ASSN. REPORT

This is one of the papers presented by the meters and services sub-committee of the Electrical Equipment Committee (J. Hellenthal, chairman) at the 1941 meeting of the Engineering & Operation Section, Northwest Electric Light and Power Assn.

Photo-electric Methods

Approximately a year ago General Electric Co. placed on the market its photoelectric meter tester. This device

has been in use in the factory, in an earlier form, for a number of years for the precise calibration of rotating standard watt-hour meters.

Essentially this equipment provides a streamlined version of the familiar start-stop method of testing meters. It permits complete elimination of the human equation insofar as starting and stopping the standard meter is concerned.

Physically this apparatus consists of a light source, a photo tube and a control box, in which are the necessary relays, selector switch and amplifier. Fig. 4 shows the appearance of the unit. In the preferred setup the anti-creep holes in the meter disc are utilized for interrupting the light beam between the source and the photoelectric tube. Fig. 2 shows the schematic diagram. The concentrated light source is focused on an anti-creep hole and the photo tube is lined up on the light beam below the disc. The interruption of this light beam by the rotation of the disc causes a succession of impulses to be transmitted to the control box, where they are amplified and used to operate a stepping relay.

In testing a meter the selector switch is set at the desired number of revolutions of the meter disc. The first impulse from the photocell causes the wiper arm to snap up to the first contact, which closes, through a relay, the potential circuit on the rotating standard. Each impulse from the photocell causes the wiper arm to snap over one notch. This continues until the number of revolutions reaches the setting of the selector switch. When this setting is reached the potential circuit of the standard is opened.

Some meters, notably the V-type polyphase, do not have anti-creep holes, and there are some styles in which the creep holes can not be lined up with the vertical light beam. For these types of meters there are two alternative methods available. One consists of attaching a small mirror to the shaft of the meter and arranging the light source and photo tube. The other method utilizes the light reflected from the meter disc and the impulses are obtained when the black mark on the edge of the disc interrupts the reflected beam. When operating in this way the "Light-Dark" switch is set on "Dark".

Careful design, together with the use of d.c. on the relays, has reduced the maximum error to ± 0.004 per cent per revolution, or 0.0004 per cent with ten revolutions. As this error is only a fraction of the possible inaccuracy in commercial rotating standards, the timing error can be regarded as negligible. As a result of the inherent accuracy that is obtained in the timing nothing is gained by long running time. It is recommended that no more than five revolutions of the service meter and five of rotating standard be used at full load and on light load one revolution of the service meter against five of the standard. This is half of the number of revolutions usually used. Another saving in time results from eliminating any necessity for repeat runs for checking.

None of the Northwestern companies have reported operating experience with the General Electric photoelectric meter tester, due, no doubt, to the short time it has been on the market. However, one company has developed, over a period of several years, a photoelectric tester which uses the light reflected from the edge of the disc. Some four or five years ago one of the company's employees built up the first working model of this tester, but since that time a number of modifications and improvements have been incorporated.

The new model has several time-saving features, proper combination of relays to obtain the desired load of the test etc. In testing polyphase meters one switch selects either element individually, and another provides either a buck or boost combination. Another unsual feature is the reset on the rotating standard which functions automatically at the end of each test run. Although developed entirely independently of General Electric equipment, the schematic diagram is very similar and consequently the comments on the experience of this company with their homemade photoelectric tester should be almost equally applicable to the factory-built equipment.

Several years ago this company conducted rather carefully controlled time studies to determine whether or not further attention to photoelectric meter testing was economically justified by savings in time. These studies indicated a time saving of 39% in testing new meters and 28% in old meters, as compared to manual start-stop testing.

In addition to the considerable saving in time the company feels that photoelectric testing has the following additional advantages:

1. Due to the elimination of the human equation in starting and stopping the standard, the responsibility for the accuracy of the test is shifted from the operator to the rotating standard.
2. Due to the fact that the standard is automatically stopped after the preselected number of revolutions, the operator can engage in work incidental to the testing while the test is in progress.
3. Due to the accuracy of the timing it has been found that a sufficiently accurate preliminary test run, prior to making adjustments, can be obtained with only one revolution of the meter under test. Due to usually dissimilar test constants the standard will not make an integral number of revolutions, but an experienced tester is, nevertheless, given sufficient indication as to the amount of adjustment required.
4. Photoelectric testing is less fatiguing to the meter tester than the manual method.

The question immediately arises as to which method of testing meters is preferable. It appears that there is little choice. The one Northwestern company using both types of equipment feels that each has certain advantages not possessed by the other but that neither has any definite overall advantage.

In larger meter departments it is believed that either stroboscopic or photoelectric equipment should be regarded as practically indispensable. Smaller meter departments should determine whether or not a time saving of approximately one-third can more than offset the investment involved. The experience of Northwestern companies indicates that the practicability of either type is above question, and a decision as to their applicability to meter department operations in any particular company should rest largely on an economic basis but with some consideration of the intangible benefits to be secured by use of these new tools.

Mobile Power Plants

"Power reserve cooperatives" are a program now being put into effect by the REA to insure against prolonged outages due to failure of power supply. The idea is that several REA distribution cooperatives within an area pay annual dues for the upkeep and amortization of a fully mobile diesel-powered generator set on a "fire engine" basis normally stored in a central location. Mounted on a trailer are two 50-kw. generators, switching equipment, transformers, water and fuel for 24 hrs. operation. They can be connected to a power line and put into operation within an hour after arrival. Trailer costs about $15,000, storage housing facilities, etc. add another $3,000. REA power systems in Oregon, New Mexico and Colorado are said already to have them or on order. User of the mobile plant pays cost of transporting, operating it and returning it to base. Member cooperators pay no rental charge, other users at a rate tentatively set at $350 per month.

Sam Hibben fried hot dogs with infra-red, explored the colorful ultra-violet

Light Widens its Horizons

IES Pacific Regional Conference sweeps the spectrum for new applications and uses

ONE per cent of daylight, unofficially, was its theme. "Objective standard" perhaps is a better term, but the program of the second Pacific Regional Conference, Illuminating Engineering Society, held at PG and E auditorium, San Francisco, April 25-26, concerned itself with the technical means to reach such an objective standard rather than the commercial or promotional methods to attain them.

Packed into a day and a half session were 21 papers, the president's dinner honoring A. D. Cameron, president IES of New York City; a vice president's luncheon honoring Frank Hansen, Pacific Regional vice president, Los Angeles, and a breakfast for street lighting men. Run precisely on time by general conference chairman Wm. P. Bear, Pacific Gas and Electric Co., the program touched concisely upon five general classifications of subjects. Lighting for war and defense, lighting in architecture and building operation, special applications such as for television, infra-red and ultra-violet, a preview of new light sources and materials, and standards and opportunities for lighting in the immediate future.

Of lighting for war and defense, President A. D. Cameron spoke twice, once on a symposium the opening morning and again at the closing of the conference. In the United States, Cameron said, the IES is cooperating with the various branches of government in an advisory capacity. This work takes three or four forms. First, with the FBI, lighting is considered important as a protective measure against sabotage and destruction of defense property. Second, the War Department has a Civil Protection Commission made up of experts in various fields. The A.I.E.E. represents the electrical industry generally and the IES has appointed Sam Hibben, director of applied lighting, Westinghouse Lamp Division, Bloomfield, as chairman of a committee to work with the government as liaison for the IES. Third, IES will probably be represented on the national Research Council in its considerations of facilities for movement of troops and traffic under war conditions. Fourth, the OPM is definitely interested in the part that light plays in the prevention of wastage and loss of production, considered greater hazards in many respects than sabotage. At the symposium, W. A. Cyr, ELECTRICAL WEST, described blackout lighting restrictions in England and the increase in lighting standards for production. An ARP street light from England was sent by British Thompson Houston Co. through General Electric Co. for display at the conference.

Uses of light for architectural purposes swept the field from schools to factories in a number of papers. Charles B. Gibson, superintendent, Mountain View School District, El Monte, Calif., encompassed the control of both natural and artificial light for optimum results and minimum expense. Albert R. Williams, prominent San Francisco architect, discussed the influence of lighting on architectural design particularly in modern functional buildings. Lighting, he said, is considered one of the important new materials with which an architect must now work.

An interesting contrast between the reason for selection of incandescent and fluorescent lighting for office buildings was presented by R. H. Long, electrical engineer, Standard Oil Co., on behalf of incandescent lighting, and Lorentz Bruun, consulting engineer, of fluorescent lighting. Long, in his paper, dealt with the economics of circuiting to provide adequate lighting capacity. Fluorescent fixtures at the present time, he said, were not entirely satisfactory because the low wattage of the largest lamp available necessitates a large number of light outlets and large fixtures. At present, he said it cannot be generally justified on purely economic grounds unless the incremental power cost is over 2½c. per kwh. In his paper, Bruun, treating the subject from the standpoint of the building management, indicated that it was easier to furnish for tenants a minimum of 30-ft.-candles on desk tops with fluorescent where rewiring would permit only limited increases in capacity.

Other papers dealing with design of both incandescent and fluorescent applications included "Fluorescent Luminaires of Today—How They Will Seem in 1945," by Ward Harrison, director of engineering, General Electric Co., Nela Park, read by Alston Rodgers, division engineer, Los Angeles; "Fluorescent Light Transmission Data on Transluscent Media" by H. Creston Doner, department of design, Libby-Owens-Ford Glass Co., read by Gilbert Trosper; "Fundamental Facts of Fluorescent Fixture Design" by F. C. Winkler, chief design engineer, Westinghouse Co., Cleveland, read by K. Knopf; "The Engineer Looks at Retail Selling" by Henry L. Logan, managing engineer, Holophane Co., New York, a paper

CAMERON BEAR HANSEN

on lense control of both incandescent and fluorescent sources, read by Frank van Guilluwe, Los Angeles; "Illumination of Jewelry and Tableware" by Fred M. Wolff, engineer, Century Lighting, Inc., New York, describing special lighting at Tiffany's, read by Carl Schammel, San Francisco, and a swift review of lighting installations in West presented in typical rapid fire style by Walter E. Potter, division engineer, G-E Lamp Co., Portland.

Of the special lighting applications, three spectacular novelties were presented. Theodore H. Shepherd, director of lighting, Bureau of Power & Light, Los Angeles, analyzed the special problems which come from the lighting of a television studio, particularly that of obtaining a satisfactory light source.

Ray M. Green, manager of development and engineering, Fostoria Pressed Steel Co., spoke briefly on the use of infra-red for drying and insect pest control. For the three days preceding the conference, Green and others had conducted a school and demonstration of infra-red applications in all phases of business, industry and home life. The versatility of its use opened the eyes as to numerous opportunities for its further application.

John T. Shannon, manager Keese Engineering Co., Los Angeles, likewise explored the potential possibilities for the use of ultra-violet light and fluorescent paints and dyes. These potentialities ranged all the way from laundry marking, criminal identification, to decoration and safety.

The experience of San Francisco Bay region in traffic safety lighting was discussed by Karl Koch, General Electric Co.

From the two major lamp companies came spectacular demonstrations of new lighting equipment. Samuel Hibben of Westinghouse plunged into the future of lighting by demonstrating present applications and projecting their possibilities. The spectrum he called a "rainbow of promise" of which "the human photo electric cell, the eye," was tuned to only a few wave bands. Extension of lighting engineering to the other wave bands he likened to increasing the scope of playing from that of a person with one finger on a piano keyboard to a full orchestration. His show ended in spectacular effects with short wave radiation.

At the close of the conference, R. E. Lagerstrom, illuminating engineer, Pacific Division, General Electric Lamp Dept., displayed the present new light sources, introducing among them a recording light meter, a new 65-watt fluorescent tube, and many improvements in design and apparatus.

Inspiration for future striving was given in two concluding papers, one by Charles T. Bakemen, commercial and industrial sales director, Puget Sound Power & Light Co., Seattle. With a new light source of such potential possibilities as fluorescent he urged raising standards to reasonable objective heights to which engineers and salesmen should work even today.

Harry N. Carroll, manager commercial and industrial sales, PG and E, concluded the conference by reviewing the opinions of commercial executives of western utilities as to the market possibilities for lighting and lighting equipment in the immediate future.

Frank Hansen, at the luncheon Friday, outlined to the all-industry gathering the scope and objectives of the IES, terming it a common denominator for the lighting profession. A fantastic ribbing of fluorescent lighting, its mistakes and difficulties of the past, provided comedy relief to the serious conference at the close of the luncheon when W. A. Cyr, presented his "So Watt and the Seven Whites."

R. N. Green revealed an infra-red way to light tobacco in the very bottom of a pipe—a great boon

A special breakfast of street lighting men called by Ed Whitehead of General Electric, brought forth not only an exceptionally good attendance but several basic ideas for improving this phase of lighting. The new IES street lighting code was the basis of the meeting. Necessity for aerodynamic engineering design in the construction of standards using a cantilever arm over the street was stressed by Roy Cruse, Taper Tube Co. Both Cameron and Hibben stressed the necessity for arousing more public appreciation of good street lighting before much progress could be made in selling it. Dr. Leland Brown of Stanford told how Palo Alto publicizes new street lighting to its citizens. Other suggestions included an off-peak rate for all-night street lighting.

Conference papers were mimeographed and assembled in a package, the sale of which financed the conference and therefore are available for detailed study of any of the subjects. Dr. Leland Brown, Stanford, was chairman and editor of the papers.

Infra-red Institute

From lice to laquers its scope of application

Everything from de-lousing of plants, animals or humans to intricate drying and preheating operations in industry were presented to successive audiences at a two-day infra-red demonstration and school held at the Pacific Gas and Electric Co. auditorium, San Francisco. April 23, 24, immediately preceding the IES Conference. R. N. Green, manager of development and engineering, Fostoria Pressed Steel Corp., Fostoria, Ohio, was the principal authority conducting the meeting under the joint sponsorship of Marwood Ltd., Pacific Coast representatives, the E. J. G. and John Graham Baraba Co., San Francisco, and Pacific Electric Motor Co., Oakland, distributors.

Meeting for the industry and industrialists were held at 2 and 7 p.m. on the two days of the demonstration and a special power company sales department meeting held in the mornings at 9 o'clock. At the latter special emphasis was placed on the technical side of infra-red processes.

J. R. Longmore of Marwood Ltd. introduced Mr. Green in each instance. At the power company session Rodney Doerr, general sales manager, PG and E, addressed his own group of power salesmen.

In his presentation, Green discussed the principles of radiant heat and then discussed the applications of it in various fields. Home uses suggested were in the killing of insects on plants and pets, various quick-drying applications at home such as finger nail polish or home paint jobs or even winter warmth over a bed in a well-ventilated bedroom.

Commercial and industrial applications ranged from quick-drying of paint in office buildings, such as refinishing of doors and walls, to the preheating of parts, drying of paint sprays, baking of lacquer, drying photographic negatives, printing inks, etc. A special meeting for printers was conducted on Tuesday afternoon, April 22.

Following the talk, demonstrations of the equipment were conducted on the stage with test samples run through portable and adjustable infra-red drying tunnels.

Infra-red Fire and Explosion Hazard Tested—Proved Nil

By J. O. Case
President, Quality Electric Co., Ltd., Los Angeles

WITH the rapidly growing interest in the use of infra-red radiant energy for the baking of synthetic industrial finishes for metal and wood, the question of possible fire or explosion hazard by its use occasionally comes up.

The solvents usually used in these finishes are tuluol, which has a flash point of 53°F., hydrocarbons, coal tar derivatives, aromatic petroleum solvents with a flash point of 80°F., and lacquer thinner with a flash point of 50°F. Because these solvents are below 100° F. flash point, which is the recognized point below which solvents are considered hazardous, the impression has been created that there may be a fire or explosion hazard in their use with infra-red radiation.

First of all, because this type of equipment is almost always used in the open as shown in the accompanying illustration, with reflectors mounted on skeleton framework, and not enclosed as with the conventional type of baking oven, there is no chance for concentration of the solvent fumes driven off in the baking process or of a sufficiently rich mixture with the surrounding air to create any fire hazard. Since the equipment is not enclosed the possibility of explosion is eliminated.

In order to determine definitely the possible effect, Quality Electric Co., Ltd., of Los Angeles, distributors for the Fostoria line of infra-red equipment, has just completed an exhaustive series of tests under conditions infinitely more severe than the ordinary operating conditions. These tests seem to prove quite conclusively that there is no fire or explosion hazard in this equipment.

A 5-gal. circular metal container was mounted in an inverted position. A series of ¼-in. holes were made around the junction of the bottom of the container with the sides to permit circulation of air. At the 12-in. bottom end of the container, two cross wires were mounted, upon which were laid the 5x7-in. 20-gage metal plates heavily coated with the various types of synthetic finishes and lacquers with which the tests were conducted. At a point 4 in. below the upper part of the container a spark gap was mounted, and a continuous ½-in. spark was maintained during the tests.

Underneath the metal plates used in the tests was mounted a 1000-watt infra-red lamp in a deep bowl reflector, capable of heating the plates to a temperature of 900°F. To the plates was attached a thermocouple as a means of checking temperatures accurately.

The first test consisted of spraying a metal plate with one of the common urea-formaldehyde synthetics and heating it to the ordinary baking temperature of 250°F. A considerable cloud of volatile solvents was driven off. These completely filled the container in the upper part of which the spark gap was in operation. With the bottom of the container open and vent holes in the top circulation was permitted which insured mixture of air with the fumes and would tend to make a more explosive mixture. The heat was applied for

15 min., or until all of the solvents were driven off. At no time during the test was there any flash whatever in the container nor was the spark brighter than in the open air.

Ignition tests were made of the fumes as they came out around the bottom of the container and also those coming out of the vent holes at the top, and at no place an ignitable mixture mix was found.

The test was repeated, using a very heavy coat of synthetic and running the temperature up to 375°F. While there were much heavier fumes than before, due both to increased volume of paint and more intense heat, there was no more indication of either fire or explosion than on the previous test.

The test was again repeated, running the temperature to 500°F. and still no trace of ignition. Temperature was then increased to 750°F. at which point the synthetic finish burned off the metal, but did not ignite, indicating that even in case of an arc or molten particles falling on the enamel it would be impossible to ignite it from this cause.

The last test was conducted using lacquer and at 300°F. baking temperature. There was no indication of ignition in this test. During all of these tests a flame applied directly to the sprayed material before baking would not ignite it.

From these tests, all of which were much more severe than in normal operation, it appears that the fire and explosion hazard with the use of infra-red radiant energy is nil.

In Spray Rooms

In order to determine the fire and explosion hazard due to fumes from an automobile which has been refinished in a spray room and afterwards baked in the same room by infra-red radiation, an investigation was made in a spray room 18 x 24 x 9 ft., equipped with an adequate ventilating system.

This prospective customer wished to roll a portable infra-red tunnel into the spray room immediately after the car had been sprayed but there was some question as to whether this would be permitted under the Los Angeles electrical ordinance pertaining to spray booths and spray rooms.

Tests made with an aspirator by the gas expert of the city fire department indicated there was no fire or explosion hazard present, and as a result this proposed installation of infra-red equipment has been approved by the electrical inspection department of the Building and Safety Commission.

These tests check with the report of Benjamin Richards, chairman of the National Fire Protection Assn. committee on manufacturing hazards, presented to the annual meeting of the association, in which he states: "Ordinarily insurance interests might consider the electric equipment used as requiring the class of apparatus called for in hazardous locations, but experience to date shows that ordinarily such locations need not be considered as hazardous areas, under the usual meaning of the term. At any rate, it is impractical to call for vapor proof or explosion proof lamps."

● To Give More efficient service to its customers and more pleasant working conditions for employes, the Salt Lake Hardware Co., one of the country's largest hardware distributors, recently installed complete new lighting equipment. Seeing light has been stepped up from 5 to 25 ft.-candles by the installation of 27 Tru-Colite direct-indirect fluorescent luminaires.

DISNEY HANSEN

Disney Scroll

So. Cal. IES honors color, lighting achievements

Lighting effects in the Nutcracker Suite of "Fantasia" won for Walt Disney a citation of merit from the Southern California section of the Illuminating Engineering Society, presented at a banquet on Tuesday night, April 22, at the Disney Studios in Burbank. About 300 IES members and guests witnessed the presentation of a beautiful hand lettered and illuminated parchment by Frank A. Hansen, director of the Western Institute of Light and Vision and Pacific regional vice-president of IES.

Inscription on the scroll was:

"The Southern California section of the Illuminating Engineering Society confers this citation upon Walt Disney, world renowned master of whimsical art, for fidelity and imagination in the creation of inspiringly beautiful effects with lighting, reaching new heights in the Nutcracker Suite of 'Fantasia'."

The citation now is hung in the famous Disney trophy room, which contains the "Oscar" statuette award received from the moving picture industry for "Snow White and the Seven Dwarfs," and the many other honors and gifts that have come to the creator of Mickey Mouse, Donald Duck, Pinocchio and others.

The meeting was distinguished by the presence of A. D. Cameron of New York, national IES president, who gave a short talk on the part IES is taking in strengthening national defense.

Donald Duck was at the affair—Clarence Nash, voice of the popular web-foot, gave a short dialogue setting forth his disapproval of IES recognition of a film without him in it.

In the Disney studio theatre the audience was initiated into the mysteries of producing the unusual "Fantasia." William A. Garrity, chief engineer of Walt Disney Productions, explained the four sound tracks used in the entirely new development, "Fantasound." Parts of "Fantasia" including the Nutcracker Suite, a Night on Bald Mountain and Ave Maria, were shown. Disney's first color cartoon, "The Band Concert," was shown to make possible a comparison between it and "Fantasia."

A film showing successive steps in the production of a Disney feature and a visit to a sound stage also were parts of the program.

● PLACEMENT, the requirements of the industry and training facilities were among the things discussed at the meeting of the Frank Wiggins Trade School, Los Angeles, and the advisory committee on electrical wiring. The Trade School conducts the apprenticeship training program in that area. Representatives from the school were Principal Leslie G. Stier, John Weiss, head of the electrical department and John Strickley, instructor in wiring. Representing the electrical trade were George DeAth of Peerless Electric Co.; Glen Arbogast, Newbery Electric Corp.; L. L. Goddard, manager, Pacific Electrical & Mechanical Co.; A. L. Stone, Stone Electrical Supply Co.; Clare J. Bennett, Bennett Foresberg Electrical Co.; J. B. Shamel, Shamel Electric Co., and George Ellicott, business manager I.B.E.W. local 83.

● SALT LAKE CITY is continuing its program of modernizing its street lighting with the installation recently by the Utah Power & Light Co. of 65 6000-lumen lamps of the new refraction type, mounted on aluminum painted cedar poles staggered on opposite sides of 21st South and South Temple Streets.

Troffers

Miller takes demonstration tour under G-E sponsorship

Arthur Miller, sales manager, the Miller Co., Meriden, Conn., covered the West in a series of trade meetings called under auspices of the General Electric Supply Corp. to explain the company's line of standardized troffers and fluorescent industrial fixtures. With a portable display set-up by which to demonstrate the company's standardized equipment, Miller explained the construction and sales features of the equipment as applied to industrial interiors and for the general lighting of commercial establishments.

Particular emphasis was placed on the wiring channel upon which the separate reflector trough may be mounted. Inside this channel the necessary auxiliary equipment and wiring is run. Mechanical support is simplified and wiring costs lowered materially because of the simplicity of attaching feeders to long runs of the troughing rather than serving separate outlets. Flexibility and provision for increased light output by adding a third lamp to the two-lamp troughing is an attribute of this system.

Later troffers for interiors of offices will be equipped with louvers of plastic material so arranged as to divert some of the light to the adjacent ceiling wherever the troffers are set flush to the ceiling itself.

Meetings were held in the following cities: Los Angeles, San Francisco, Salt Lake City, Denver.

Value of continuous troughing systems for industrial or built in commercial fluorescent lighting were demonstrated with portable equipment

Schanuel Tour

Bureau speaker to reach non-professional groups

The National Adequate Wiring Bureau is arranging a wide Western speaking tour for its field representative, Arthur E. Schanuel—with the unusual basic idea of presenting these electrical standards discussions before groups of bankers, builders and home buyers, who are showing increasing interest in the objectives of the industry's program to assure adequate electrical facilities in homes. Cooperation of local organizations, in securing proper facilities, audiences and dates, is requested by the National Bureau. A tentative schedule for Schanuel's speaking program is: Denver, May 20-21; Salt Lake City, May 23-24; Boise, May 26-27; Salt Lake City, May 28; San Diego, June 2-3; Phoenix and Douglas, Ariz., June 4-6; Los Angeles, June 9-10; Fresno, June 11-12; San Francisco, June 13-17; Portland, June 18-19; Yakima, Wash., June 20; Seattle, June 23-24; Tacoma, June 25; Spokane, June 26-27; Butte, Missoula, Billings, Mont., July 1-3.

Special meetings already scheduled include: With Electrical League of Utah, May 22, architects, building and electrical contractors, finance agencies, E. J. Strong, in charge. Boise and Twin Falls, Idaho, May 26, 27, with Adequate Wiring Bureau of Idaho, J. Carl Baldridge in charge. San Diego Electric Club, June 3, A. I. Benedict in charge. Bisbee-Douglas and Globe-Miami, Ariz., July 4, 5, 6, dealer-employee meetings with Cavett Robert, Arizona Edison Co. in charge. Los Angeles Electric Club, June 9, Frank J. Airey in charge. San Jose, Stockton and Sacramento, June 13-17, meetings with building and electrical contractors, architects, Jared H. Hill, in charge.

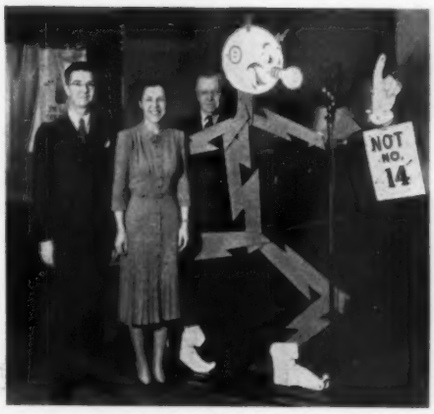
Lead Kindly Light

Rev. Frederick J. Cox, pastor of Denver's Warren Methodist church, believes in the precept "let your light so shine before men—" that he has given it practical application through electricity. Easter Eve (April 12) his church assumed the title of "best lighted place of worship in the nation" when, for the first time, a battery of seventeen floodlights, projecting traditional Easter colors, illuminated the exterior. The installation is permanent, Rev. Cox being convinced that all-year-around advertising with electricity, to promote the interests of religion and attract worshippers, is consistent with the dignity and beauty of Christianity.

Rev. Cox is convinced that the church must compete with the automobile, radio, motion picture shows and other forms of recreation and amusement. He believes the church should stand as a visible beacon at night, instead of being darkened, to remind present and potential worshippers of the "merchandise" available within the sacred portals.

Carrying the "commercial" idea further, Rev. Cox has had the interior of his church completely wired and equipped to help dramatize his sermons. Intense or diminishing light effects, provided by the expert manipulation of controls, serve to emphasize the "punch lines" in his discourse.

The Warren Methodist church's electrification is a direct result of the Rocky Mountain Electrical League's annual Christmas lighting contests. Rev. Cox took counsel of a consistent prize winner in planning the exterior lighting design and called on RMEL officials for advice on such practical matters as adequate wiring, outlets and service units.



Reddy Killowatt broadcasts from his adequately wired script against No. 14 wire, for RMEL. T. M. Foulk, Elizabeth Rece, F. R. Jamison of its A-W Bureau put him up to it.

Butte Pump & Motor Works, of Chico has made a success of Red Seal Adequate Wiring as the photos surrounding Ernie Cook and Bruno Marzolla attest

Eye Rejections

Laid to bad lighting

Poor eyesight is responsible for more rejections by Army induction boards examining draftees under the selective service act than any other ailment but one, according to a preliminary survey made by the Medical Division, Selective Service Headquarters, Washington, D. C. This information was released by National Better Light-Better Sight Bureau after a study of the situation.

Thirteen percent of the candidates rejected by Army boards can blame vision that is not up to Army standards. Selective service doctors maintained by local boards, turned down 9% of those rejected, for poor eye sight. Army doctors turned down 13% more. A total of 22% rejected by both boards for eye defects is the highest total of rejections for any failure with the exception of bad teeth. "These statistics," says Glenn Trumbull, manager National Better Light-Better Sight Bureau, "are much higher than has been expected and show the need for continued education of the public to the principles of better light-better sight that are so important from the viewpoint of sight conservation."

LIGHT for a DRESS SHOP

Fluorescent

Who

Marie's, 969 Market St., San Francisco. Layout by C. E. Wissing, Graybar Electric Co.

The Need

Ample illumination and attractive appearance for the sale of ladies' dress apparel, both in the store and window display.

Conditions

Store 115 x 45 ft. broken by two rows of columns down the length of the space. Walls, light cream. Ceiling 18 ft. high, white, reflection factor 80%.

Installed

In the store, 50 Wakefield Beacon, B448, each containing 4 40-watt Mazda F fluorescent lamps, white, on 9-ft. centers crosswise, 11-ft. 6-in. lengthwise. Wall cases separately lighted by fluorescent lamps on channel behind frame of case. In windows, 28 Curtis 936C Attraction Zone show window units with 2 100-watt Mazda F lamps in each, plus 2 Curtis 934 with 4 30-watt F lamps each. A row of 200-watt flush mounted X-ray reflectors near the back of the window was left in from previous tenant.

Results

Initial average 45 ft.-candles after 100 burning hr. At ends of room 39 ft.-candles minimum. Maximum in center 52, uniformly distributed. Shadowless and because of height, glare impression extremely low.

LIGHT for a STORE FRONT

Fluorescent

Who

Seattle City Light suburban office and appliance store. Design by L. R. Muth, illuminating engineering dept.

The Need

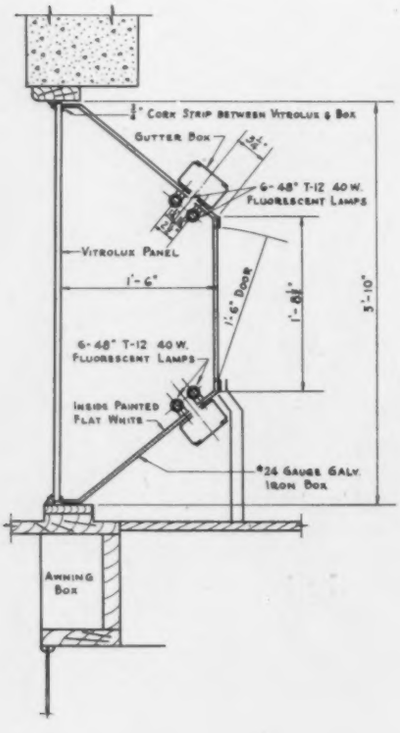
A luminous front and sign to attract attention to the office and merchandise display.

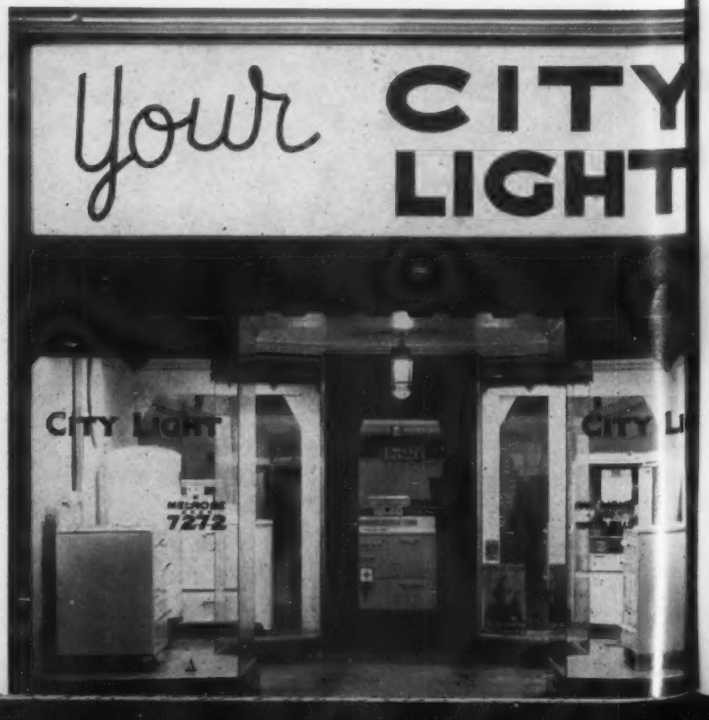
Conditions

Luminous panel above windows, 15 ft. wide, 48 in. high.

Installed

Light box, covered by ivory Vitrolux glass with maroon letters fused on; contains two rows, 6 lamps to the row, of 40-watt F fluorescent lamps. Interior of store has continuous trough, dropped 3 ft. from ceiling at center, equipped with 24 40-watt white fluorescent lamps. Result, 22 ft.-candles at sides, 30 in center.





NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION

Utilization Data Sheet No. 41

SUBJECT ..... SPECIAL FRYER
SERVICE CO. ..... PUGET SOUND POWER & LIGHT CO.
CUSTOMER'S NAME ..... MALONE CANDY CO., SEATTLE
TYPE OF BUSINESS ..... CANDY AND FOOD
SIZE OF BUSINESS ..... FIVE EMPLOYEES

Prepared by Lloyd Steele
For Industrial Committee

Operating Data

Product:	Processed Corn
Production:	50 lb. per hour
Labor:	150 man hours per month
Fuel—Electricity:	900 kw.-hr. per month
Operating Period:	6 hours per day
Temperature:	370 deg. F.
Other Vital Data:	Heat up period with 160 lb. of grease—½ hour

Description of Process

Deep fat frying with electricity is accepted as being the most desirable method of preparing fried foods. With this in mind, the Malone Candy Co. investigated the possibility of applying electric deep fat frying to their new corn product. They wanted a continuous operation.

A circular tank 36 in. in diameter, 8 in. deep with a 12-in. circular opening through the center was constructed, giving it an annular appearance. One portion of this ring was closed as if a keystone shaped piece was inserted; thus providing space for the finished product to be discharged from the fat into a basket.

Revolving arm is mounted in the 12″ center space which travels at predetermined speed carrying product in front as it cooks in fat. In picture revolving arm not shown.

A perforated false bottom is mounted inside the annular ring at a level so that about an ich of fat is above it. False bottom allows fat to circulate freely from the elements up into the cooking area and also serves as a separator.

The elements are mounted 1″ above the bottom, providing for a cooler space near bottom, and are evenly spaced resulting in an even distribution of heat.

Mr. Malone states this installation is most satisfactory, and that he could not have wished for anything better to process his new product.

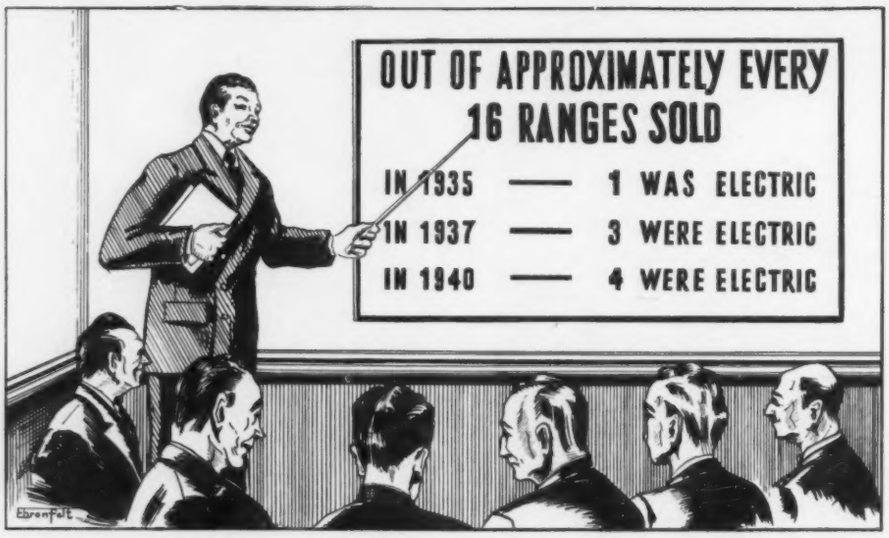
This type of deep fat fryer may be used for other processing, such as continuous potato chips, popcorn, doughnuts, etc.

Equipment

New Installation — Rating	Equipment Cost	Installation Cost
1—20 gal. circular tank	$ 85.00	.....
6—T-K immersion units, 2 kw. = 12 kw.	72.00	.....
1—Chromolox A.R. 30 thermostat	12.50	.....
1—Square D magnetic 3-phase contactor	25.00	$ 67.50
Total	$194.50	$ 67.50

Realized Advantages

Advantages of Frying Process	Advantages of Electrical Proce
1. Better product	1. Reduced fire hazard
2. Uniformity of color	2. Low maintenance costs
3. Continuous operation	3. Close temperature control
4. Increased production	4. Automatic
5. Compactness and space saver	5. Low operating costs


OUT OF APPROXIMATELY EVERY
16 RANGES SOLD
IN 1935 — 1 WAS ELECTRIC
IN 1937 — 3 WERE ELECTRIC
IN 1940 — 4 WERE ELECTRIC
Ebrenfeld

Why Sell Electric Ranges?

*By W. H. Dudley**

L. A. District Manager, Frigidaire

"WE'RE GOING to take off the gloves—we are going into a slam bang range campaign in March that will top anything ever before attempted by this industry. 1941 is going to be our record breaking year. We want you to give us facts and proof on Why It's Good Business to Sell Electric Ranges." Those were my instructions at the start of these talks.*

Certainly, there is nothing that I like to talk about or that I believe you would rather hear about in the range business or any other business than—

MONEY

Yes, sir, it's the old Do-Re-Mi that makes any business proposition worth listening to. It's coin of the realm that makes the wheels go round and things happen.

So let's consider first of all—not only what kind of money—but how much of it there is to be made when a prospect is located and the opportunity exists to wrap up a piece of cooking equipment.

This sale, like most others, can be for an electric range or it can be the competitive fuel type. If we are to arrive at a sound conclusion, our best procedure, I believe you will agree, is to deal with averages. We have dug out the facts and find that by eliminating those sales made in apartments, housing deals, etc., in this area in 1940 the average gas range retailed for $103.28—really not bad. I thought it was less than that—but let's go on and see what happens to that one hundred bucks.

RETAIL SELLING PRICE	$103.28
Less allowance old stove	10.33
Net sale	92.95
Dealer's net cost	60.72
Gross profit	32.23
Salesman's commission	9.29
	22.94
Delivery cost	3.50
	$ 19.44

Nineteen dollars and forty-four cents, and nothing yet has been deducted for overhead—rent, taxes, salaries, etc. This will vary so much that we will leave it up to you to compute for your own operation.

There is often the possibility, I am told, that an ad in the paper offering this same range for less money sends the customer back insisting that his part of the deal be good even to the last drop—but we don't go into that.

Let's now consider what would have happened, dollarwise, if we had taken a little more time—and frankly, we admit it does take more time—and *sold* an electric range—a sale which, with quantity orders deducted, averaged—in this territory in 1940:

RETAIL SELLING PRICE	$212.46
Less allowance old stove	10.62
Net sale	201.84
Dealer's net cost	127.48
Gross profit	74.36
Salesman's commission	20.18
	54.18
Delivery cost	3.50
	$ 50.68

Fifty Bucks—that, ladies and gentlemen, is not hay. Now we are getting somewhere—especially when we consider that this sale was made simply because the dealer *chose*, as his *policy*, to *sell* electric instead of permitting customers to *buy* gas ranges.

Now, suppose he *sells* 50 average electric ranges—that's $10,000 worth of business that will enable him to pay commissions of over $1,000 and still have a gross for his business overhead and himself of over $2,000. That, I repeat, is not hay—and how much better to have used some salesmanship and earned those dollars instead of letting those fifty people *buy* gas stoves—providing only a few hundred dollars for the boys and obtaining for himself only the questionable pleasure of doing business for his health.

Do you want those extra dollars? Do you? Of course you do! Well, friends, they are there for you in 1941—you have but to *choose* to get them. Establish your policy now—to *sell* electric. Go along! Do your part and those dollars will be yours.

Let's consider now some of the other benefits to you and to your business when the ranges that you sell are operated electrically.

I believe you will agree that nothing is more important if your business is to grow and prosper than—

GENUINE
CUSTOMER
GOOD-WILL

So, with this in mind, let's just place ourselves in the housewives' shoes for a

* A talk as presented to dealer meetings during the Popularity Campaign.

moment and—open-mindedly—try and decide whether we'd be *happier* with a gas range or an electric range. To get over my points quickly and more vividly, I am going to let this electric light bulb represent the electric range and this candle the gas range.

First, let us consider convenience. We all know how easy it is for us to get the service we want the electric way, whether it's for cooking or lighting, by simply flipping a switch like this. Simple electric controls start foods on their way to cooking, baking or broiling—they even look after the foods while we are away. Contrast this with many ranges that have to be lighted with a match like this (light candle). True, many gas ranges have automatic lighters, but these are subject to blowing out from drafts or low pressure—and while a few have automatic timers, these have never proved very practical.

Next, let's—as users—think about cleanliness. Certainly I could hold a skillet over this electric bulb, or over an electric cooking unit indefinitely without the slightest trace of smudge or grease. Whereas, with the gas range, it is a well known fact that burners, not perfectly adjusted, *will* smudge utensils. Then, too, the gas itself gives off particles of dust and by-products of combustion, that make it necessary more frequently to clean not only the range itself, but the walls, curtains and woodwork in the kitchen.

Another point, and one that is going to be increasingly important in the months ahead, is coolness. Because of the much greater efficiency of electric units compared with gas, much more of the heat generated is used for actual cooking instead of heating the room. For example, the gas surface cooking unit will exhaust about five times as much heat into the room as an electric unit.

The same efficiency is true about electric ovens because they can be insulated on *all six* sides with the heating unit on the inside. But, with gas ovens, this is not possible because air is needed for combustion, and if the flame were to be completely enclosed, it would quickly go out like this (put inverted tumbler over candle.)

Another thing about coolness — we have all heard the expression, "It isn't the heat, it's the humidity." The more humid the kitchen, the hotter it is—yet I wonder how many people realize that a small size gas surface unit will release nearly a pint of water every *hour* and this in addition to moisture being released by the foods that are being cooked.

Another important factor to consider in building our customer good-will is *safety*. This electric bulb, like an electric unit, has no flame—it gives off no odors—it cannot blow out—windows can be opened wide—there is no danger.

When we add up these and the many, many other advantages of electric cooking, we must admit that if we were the housewife, we *would be* happier with electric equipment. Surely this is proof to us that not just customer acceptance, but good-will that is enthusiastic, usable and valuable, goes to the fellow who has made his range sale an *electric range* sale.

Another attractive fact about selling electric ranges is that the electric range business is a—

GROWING
EXPANDING
BUSINESS

And I mean by growing and expanding that the *electric range business* is growing faster and expanding to a greater extent than any other kind of range business, *including* the gas range business. As Al Smith says, let's take a look at the record—

FROM 1933 TO 1939, GAS RANGE SALES INCREASED 87%. DURING THE SAME PERIOD ELECTRIC RANGE SALES INCREASED 580%

In 1940 one-third of all electric ranges sold were sold to *REPLACE* gas ranges. Here are some more facts—

OUT OF APPROXIMATELY EVERY 16 RANGES SOLD IN 1935 ONE WAS ELECTRIC; IN 1937 THREE WERE ELECTRIC; IN 1940 FOUR WERE ELECTRIC

Electric range sales are on the upswing—over 400,000 units were sold in 1940—and there is every indication that national sales annually will total one million by 1944.

There is another thought, in closing, that I would like to leave with you, one that always gives me a certain amount of pride—the very association with the Magic of Electricity. It is magical to cook by the same wires that give us cold in our refrigerators and sound in our radios. And, when by this magic we know that we have not only placed our business on the sound foundation of maximum present and future profits, but, at the same time, we have provided in the homes of our customer friends the convenience, the cleanliness, the beauty and economy of an all electric kitchen, certainly there can be no doubt that the range for my business—and for your business — shall be an *electric range*.

MKB Quota

Western Award Winners

QUOTA of 53,513 electric range sales assigned by Modern Kitchen Bureau to 116 utility companies, as part of the Fall 1940 campaign, was exceeded by more than 15,000 ranges. Complete reports show that these 116 companies sold a total of 69,179 electric ranges in Sept., Oct., and Nov. As a reward for "distinguished service", utilities who made or exceeded their quotas are being awarded a handsome plaque. Western companies thus recognized include: Arizona Edison Co., City of Seattle, Dep't of Lighting; Modesto Irrigation District; Mountain States Power Co.; Nevada-California Electric Corp.; Northwestern Electric Co.; Montana Power Co.; El Paso Electric Co.; Utah Power & Light Co.; Valley Electrical Supply Co.; Pacific Gas and Electric Co.; Pacific Power & Light Co.; Portland General Electric Co.; Public Service Co. of Colorado; Puget Sound Power & Light Co.; Sierra Pacific Power Co.; Southern California Edison Co., Ltd.; Tucson Gas, Electric Light & Power Co.

● THE H. M. Crawford trophy awarded to the PG and E Co. to the division sales manager with the year's best record of accomplishment in securing cooperation of localized industry groups for business development was won in 1940 by L. J. Brundige, sales manager of the company's Sacramento division.

This is the second year in succession that Brundige has won the Crawford trophy. The award is based on the highest efficiency in organizing dealers to participate in industry development campaigns and personal initiative and resourcefulness in conducting local cooperative sales activities. The trophy consists of a specially silver mounted electric clock surmounted with mythological figures.

Desert Coolers Bloom Again

Pioneer Arizona market indicates trend toward manufactured units

Summer starts early in Arizona. Already dealers, distributors and the utilities are well into the program for the sale of cooling systems for this summer.

Indications from a review of the situation in Arizona, Imperial Valley and other desert regions of the West show that the day of the homemade cooler seems to be done. Born in the summer of 1935 in Phoenix, the window cooler has come a long way since that time. At first it was kidded, then taken up with all kinds of homemade adaptations. Window coolers correctly built and well-installed did a satisfactory cooling job and brought relief to thousands.

At first the utilities, such as Central Arizona Light & Power in Phoenix, the Nevada-California Electric Corp. in the Imperial Valley, and others circulated promotional literature advocating either the purchase or the building of home coolers. Diagrams were shown to illustrate the correct construction principles and practical sound advice given on both the construction and operation of coolers.

First effect was the killing of the fan market which dropped from a carload a year to 8 or 10 fans per dealer but it did boost the sale of ⅓, ¼ and ½ hp. motors. It also developed both the blower and the fan type of cooling system and many manufacturers brought out a special unit consisting of motor, blower or fan and water pump for circulating water through the excelsior pads.

The moisture problem was soon solved when it was found that driving the cooled air into a room against pressure would cause condensation. However, if there was an outlet for the air, the circulation carried off the excess moisture.

Another problem was that of the growth of algae in the excelsior pads. Making of unit pads for easy replacement and a low-cost replacement of pads has solved this problem. Early instructions gave customers suggestions to spray ordinary baking soda over the pads' surface to prevent algae growth.

Effect on the unit air conditioning market has not been noticed. In the first place, the unit air conditioners were not selling to any great extent because their capacity was limited as a rule to one or two rooms only. The air-cooled types of unit air conditioning did not prove as satisfactory as the kind that used well or city water for the absorption of the heat. The outside air in some instances was so hot that it was impossible to dissipate any more heat into it.

Desire for better appearance and better performance and the response of a number of manufacturers in the making of inexpensive fan and blower type coolers has shifted the trend away from homemade to factory built units. Prices range from $35 to $150 and many dealers are handling the makes of the various manufacturers. In fact, the market is so well covered by dealers that the utilities are stepping back out of the picture themselves.

In its broadsides last year, Central Arizona Light & Power presented to customers and prospects a comprehensive choice of various types of cooling installations. First it showed the evaporative type cooler installation so familiar to the Southwest. Next it advocated a complete air-conditioning heat and cooling system with the practical suggestion that it be installed as a split system. The split system provides for the direction of the cool air to living quarters during the day and to sleeping rooms during the night. Combination gas heating and electric refrigeration cooling systems were advocated. For commercial and other installations, dry air cooling and full air conditioning was advocated.

Principal manufacturers supplying the market are Shasta Cooler made by Utility Fan Corp., Los Angeles; Coolmore made by Hammond Aircraft Corp., South San Francisco; Payne Coolerair made by Payne Furnace Co., Beverly Hills; Palmer made by Palmer Mfg. Corp., Phoenix, Arizona; Arctic Cooler made by Goettl Bros., Phoenix; Airline made by Airline Corp., Los Angeles; Coldwave made by Tempered Air Mfg. Co., Phoenix; Wallace Coolers by Wallace Air Conditioning Co., Phoenix.

So. California too

An anticipated big sales season on evaporative coolers is being preceded in southern California by dealer meetings sponsored by the state board of education under the George Dean Act, in cooperation with manufacturers and the Southern California Edison Co. Identical meetings are being held in San Bernardino, Pomona, Santa Ana and Pasadena, each drawing attendance from a large area. Meeting once a week for four weeks in each city, the schools are being held to acquaint dealers with the latest developments in evaporative cooling and to prepare them to "cash in"

Retail Appliance Dealers Assn. of Utah, the dealer arm of the Electric League, with W. C. Hollingsworth, of Auerbach's, chairman, at the center, has adopted the refrigerators "blue book," a national publication, as a guide on trade-ins. Provo, Ogden and Salt Lake City dealers, 90 in all, have bought it for guidance. "With shipments uncertain, prices rising," said Hollingsworth, "dealers should strive to get net profit from used model sales."

on this year's rapidly growing market.

The first night's program presents an introduction by H. C. Rice, Edison Co. manager of domestic sales, and a talk on cooling and comfort by H. H. Douglas, Edison Co. air conditioning engineer. Installation of coolers will be covered at the second meeting by H. S. Mulhollen, sales manager of Essick Machinery Co. At the third meeting E. A. Gunther, sales promotion manager of Utility Fan Corp., will cover selling points, and the fourth program will be a round table forum of questions and answers, with Douglas as chairman. All manufacturers and jobbers will be represented at the last meeting.

The schedule of the meetings is as follows:

San Bernardino, April 28, May 5, 12, 19, San Bernardino Junior College; supervisor in charge, A. G. Stoll of the junior college.

Pomona, April 30, May 7, 14, 21, Edison auditorium; supervisor, Keith F. James, coordinator of distributive education.

Santa Ana, May 1, 8, 15, 22, Francis Willard Junior High School; supervisor, W. W. Wieman, principal of the vocational evening high school.

Pasadena, May 2, 9, 16, 23, Pasadena Junior College; supervisor, George Juett, cordinator of distributive education.

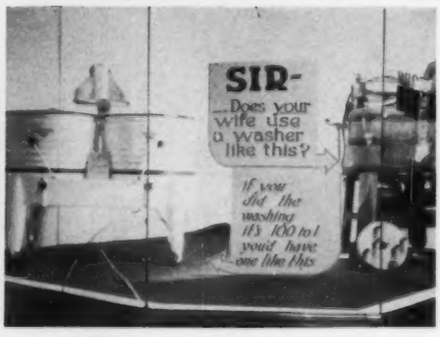
Kitchen visualizer, above, demonstrated by Margurette Reinhart, home service director, was designed by Pocatello's sales manager, S. C. Rhoads, built by C. Halford, Idaho Power

★

Margaret Minty, home service advisor at Pocatello, (right) conducted a Gladiron demonstration in the window during an ironer campaign. Other offices had similar stunts

★

Below, clever contrast windows, showing old and new appliances, were traffic stoppers for Brown's Radio Studios, at Ogden, Utah. They were done by Adrian Godfrey, salesman there



Bride Campaign

Appliance Society drives on gift appliances

First campaign of the season for Electric Appliance Society of Northern California will be an appliance gift promotion—stressing small appliances for the bride, for the new home, and other gift purposes. The campaign will run May 26 to June 7, is the first of its kind to be sponsored by the Society, and will be confined to the San Francisco bay region.

Harry A. Saxe, Jr., Sterling Furniture Co., was unanimously elected state president of Electric Appliance Society at the annual meeting, April 10. Saxe recently announced appointment of Richard W. Hurff as managing director of the Society. Other new Society positions are: Lyman W. King, Jackson Furniture Co., vice-president; R. E. Fisher, Pacific Gas & Electric Co., secretary; S. W. Newman, Chas. Brown & Sons, treasurer; O. E. Rush, PG&E, promotional director. Directors include: L. J. Breuner, John Breuner Co., Oakland; Charles Redlick, Redlick-Newman Co., S. F.; H. H. Courtright, Valley Electric Supply Co., Fresno; J. A. Werner, Dohrmann Commercial Co., S. F.; E. C. Lipman, The Emporium, S. F.; Edward Lachman, San Francisco; Marshal Hale, Jr., San Francisco; Carlton Bryan, Maxwell Hardware Company, Oakland; L. W. Hink, J. F. Hink & Co., Berkeley; E. D. Hotaling, Apex Rotarex Manufacturing Company, Oakland; R. E. Robertson, Frigidaire Corporation, Oakland; A. H. Meyer, Leo J. Meyberg Company, San Francisco; F. S. Fenton, Jr., Easy Washing Machine Company, San Francisco; J. P. Carson, Graybar Electric Company, San Francisco; D. E. Harris, General Electric Supply Company, San Francisco; LeRoy Smith, California Retail Hardware Association, San Francisco; George W. Fitch, Retail Furniture Association of California, San Francisco; Frank K. Runyan, Western Merchandise Mart, San Francisco; O. R. Doerr, Pacific Gas & Electric Company, San Francisco; Arthur E. Rowe, Pacific Radio Institute, San Francisco; and R. J. Holterman, Westinghouse Electric Supply Company, San Francisco.

● A SILENT AUCTION was the sales stunt used to draw crowds to the premier showing of the new Norge refrigerators by the Good Housekeeping Shop of Reno from Mar. 3 to 8. Sealed bids were accepted on a new 1941 model and the refrigerator sold to the highest bidder regardless of price with a bid opening at 8 p.m., Saturday night. All other bidders provided an active prospect list to be developed later.

Dealers' Plea

Defense of the appliance retailers and wholesalers in the case brought against them by the Department of Justice charging conspiracy to fix prices in Los Angeles, will be based upon jurisdiction. The defendant association, Retail Furniture Assn. of Southern California, and others, maintain that they are engaged in intra-state business and therefore do not come under the Sherman Act provision; also that they have a right under the state Fair Trade Act to do all of the things charged in the indictment.

California law permits manufacturers to set minimum resale prices on their products in contract with distributors and retailers and provides penalties for violation. Accepted practice has been for various trade associations to police the law in their particular field. The defendants will maintain that in Los Angeles, where price cutting and chiseling have been especially bad, they were merely protecting responsible and ethical business under the provisions of the Fair Trade law, enacted for that very purpose.

The indictment is another of the conflicts between Thurman Arnolds' philosophy of the Sherman Act enforcement and the Fair Trade laws of the states. Recent Supreme Court decisions in the Wage and Hour Act give cause for concern lest the broad interpretation of what is inter-state business rendered in such labor cases may be applied to the business field. In such case, the attorneys for business associations declare, state sovereignty over business or over practices affecting local business would virtually be wiped out and central federal jurisdiction over business prevail.

No industry or business so far indicted has carried the case to an upper court. Virtually all have endeavored to escape the expense of litigation by entering consent decrees with the Department of Justice. The electrical contractors' case in San Francisco is still pending because it is going to trial, the defendants insist.

The grocery industry in San Francisco has used a different method. The state Unfair Trade Practice law, which prohibits selling below cost and sets up a definition of what constitutes cost, is used. An industry-wide survey of cost-of-doing-business was conducted by a firm of accountants and certified to the District Attorney's office. Cases in violation of the state law are directed to the District Attorney for prosecution. In this way the association is not involved in the policing of the law.

Edison Spring Meet

Eighth annual spring conference of the Edison Electric Institute, held in Chicago, March 31-April 3, under the chairmanship of R. E. Fisher, vice-president in charge of Publications and Sales, Pacific Gas and Electric Co., had the largest attendance, and was reported one of the best sales meetings in the history of the organization. About 10 representatives of western utilities were present at the meeting.

R. E. Fisher delivered an address before the general sessions on the subject "Preparedness for the Post-War Period" and O. R. Doerr, general sales manager, PG and E, addressed the general sessions on the subject, "Rewiring Commercial Occupancies."

In all 62 speakers were scheduled during the conference which lasted a whole week and covered an all inclusive list of sales subjects.

Range Repeater

Southern California's all-industry electric range Popularity Sale held during March was so successful that plans are under way for a similar event next fall. Continuation of the cooperative movement was voted unanimously at a meeting of sponsors held April 21 at the Los Angeles Electric Club.

In spite of "unusual" rainy weather throughout most of the month, all sponsors report March dealer sales far above normal. The buying impetus set up during the sale extended into April and was an important force in making sales for that month well above average. The campaign also had the desired effect of increasing dealer interest, and wholesalers report increases in sales to dealers of from 40% to 100% over March, 1940.

Sponsors of the Popularity Sale were southern California manufacturers, wholesalers, dealers and the Southern California Edison Co., Los Angeles Bureau of Power and Light, Glendale Public Service Dept., Burbank Public Service Dept. and Pasadena Light Dept.

With any 1941 model of ten makes of electric ranges, buyers were given a free eight piece aluminum cooking set with a retail value of $14.75. Range prices were quoted installed, and special terms of as low as 15c a day were offered.

The only objection made to the campaign at the meeting April 21 was that its duration had been too short to allow fullest realization of its benefits. It was decided to extend future events over 60 days or longer.

It was also voted to identify dealers' salesmen more closely with the next campaign, extending special inducements to capture and maintain their interest in selling electrical equipment.

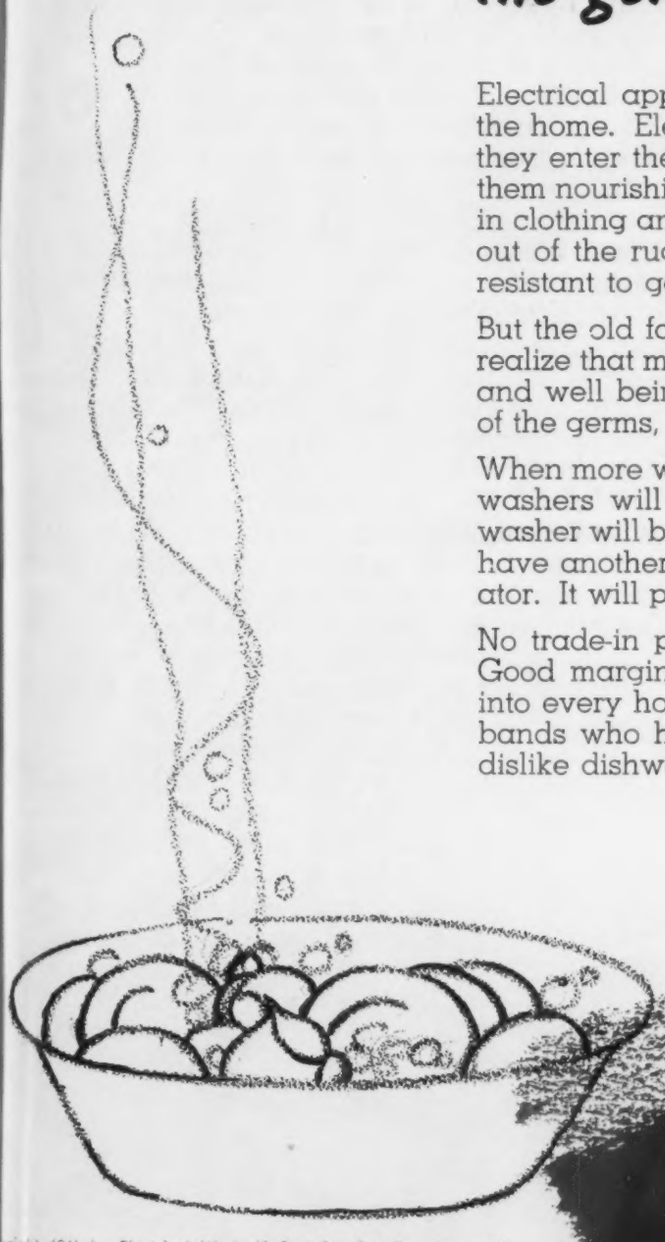
The same committee that directed the Popularity Sale was appointed to prepare preliminary plans for the cooperative sales drive next fall. H. C. Rice, Edison Co. manager of domestic sales, presided at the meeting.

Electric Kitchen of the combined residence, service depot, office and display room of Branch Manager Elmer Lee, at Gray's River, Wahkiakum County, Wash., Pub. Utility Dist. It also serves as demonstration kitchen, Mrs. Lee assisting customers

PRINT IN BINDING

ELECTRICAL WEST Sales Guide

the germs' Last Stand



Electrical appliances have just about driven the germs out of the home. Electric refrigerators now protect foods from them as they enter the home. Ranges cook foods the best way to make them nourishing. The Washing machine destroys dirt and germs in clothing and linens. Vacuum cleaners draw germ laden dirts out of the rugs. The sun lamp helps keep the family healthy, resistant to germs.

But the old family dishrag still persists. Few of your customers realize that much of the other cautions they take to guard health and well being are just about cancelled out by that last stand of the germs, the dishrag.

When more women realize that startling fact the market for dishwashers will open up. All the funny resistances to the dishwasher will be swept aside and as a dealer or salesman you will have another of those opportunites that came with the refrigerator. It will pay to speed the day of its coming.

No trade-in problem yet, no price war, no cheap competition. Good margin for specialty selling and a market that reaches into every home that eats. Busy women, business women, husbands who hate to help with the dishes, all the children who dislike dishwashing—they'll all volunteer on your side.

ELECTRIC DISHWASHER

MAY 1941

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ELECTRIC DISHWASHER Selling is fun WHEN YOU KNOW YOUR STUFF!

Battleground

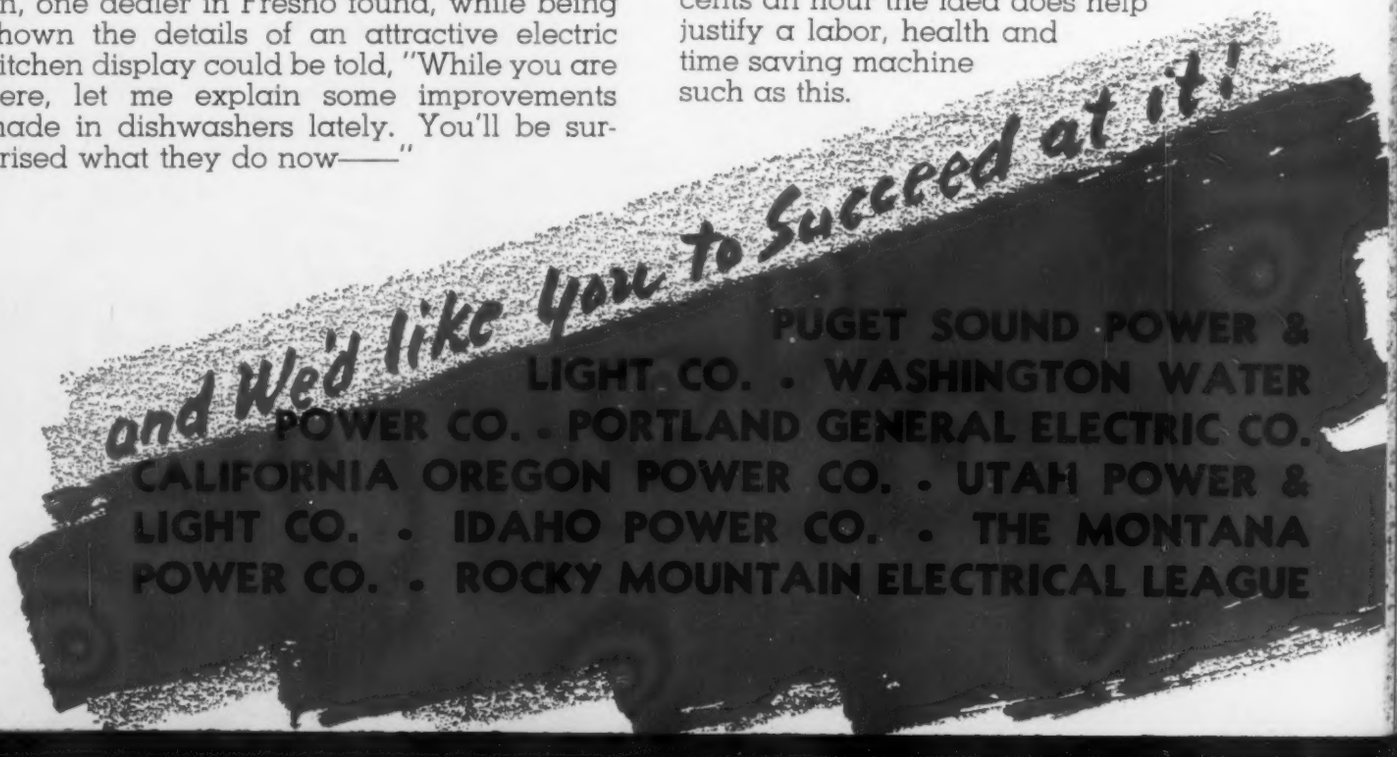
At the New York World Fair one of the exhibit hits was the "Battle of the Ages", staged between Mrs. Modern and Mrs. Drudge. Repeated at the San Diego Electrical Exposition at Christmas it was an outstanding hit again. Everyone enjoys a good fight, and there was plenty of action in this one. But most important was the interest it aroused in dishwashers. Proved to be one of the cleverest ways to attract attention to and break down resistance against the electric dishwasher.

Stage was set with a dishwasher on one side, an open sink and drainboard on the other. An equal number of dirty dishes, and they were dirty, were given each. Rules announced by the referee declared that the first finished with them would be the winner, but the dishes must be clean, dry and unbroken. Both started at the gong, the referee announcing the progress of the battle rapidly. Mrs. Modern leisurely placed the dishes in the washer, turned on the controls and sat down to knit. Mrs. Drudge rushed with water, soap, rinsing, drying; she splashed water, dropped a slippery dish, broke it. The referee rejected some dishes not quite clean. Her hair became disheveled in her hurry, her face red, her clothes splattered. Long before Mrs. Drudge was finished, Mrs. Modern turned off the controls and allowed her dishes to dry. The referee announcing the battle as though it were a prizefight, examined the dishes at the dishwasher, checked Mrs. Drudge, found her still striving, her dishes not clean or dry, and announced Mrs. Modern the winner, held her hand high. Mrs. Drudge threw down her towel in defeat and stomped out.

Disbelief is what you have to kill in dishwasher sales. And a lively demonstration like the dishwashing battle, is a convincer. It convinces a lot of prospects at one time. For individual convincing the individual demonstration works wonders. Home demonstration with a portable model is best when handled right. Be sure to make it clear that the temporary inconvenience of filling by a hose to the sink and draining it the same way will not be necessary with the permanently installed dishwasher. Leave the demonstration model several days. Let the prospect get used to "the feel of the wheel." Once it is discovered that it really does dishes, and does them better than by hand, with an extra dividend of saved time and energy, the sale is on its way. Remember that the pioneers had to find out the same thing about the clothes washer, the refrigerator, the electric light, even the bathtub and the kitchen faucet. Once they were a luxury, and a person wasn't too sure whether they would really work.

Skeptical prospects often will not even give you a chance to demonstrate—at first. But several "wouldn't-have-one-on-a-bet" women, one dealer in Fresno found, while being shown the details of an attractive electric kitchen display could be told, "While you are here, let me explain some improvements made in dishwashers lately. You'll be surprised what they do now——"

Thrifty prospects may consider a dishwasher an unwarranted luxury unless the expenditure can be balanced up by money savings. Labor, health and time savings they may accept, but a stern conscience may demand financial savings, too. One manufacturer has estimated a saving of $96 a year from the use of a dishwasher, by giving a value to the equivalent of 40 working days of eight hours each spent in dishwashing, to health insurance, to breakage of dishes, to soap, laundering of dish towels, to beauty treatments and cosmetics to restore dishpan hands. In two years a dishwasher would more than pay for itself by that calculation. Even if a prospect does not value her own time at 30 cents an hour the idea does help justify a labor, health and time saving machine such as this.


and We'd like You to Succeed at it!
PUGET SOUND POWER & LIGHT CO. • WASHINGTON WATER POWER CO. • PORTLAND GENERAL ELECTRIC CO. CALIFORNIA OREGON POWER CO. • UTAH POWER & LIGHT CO. • IDAHO POWER CO. • THE MONTANA POWER CO. • ROCKY MOUNTAIN ELECTRICAL LEAGUE

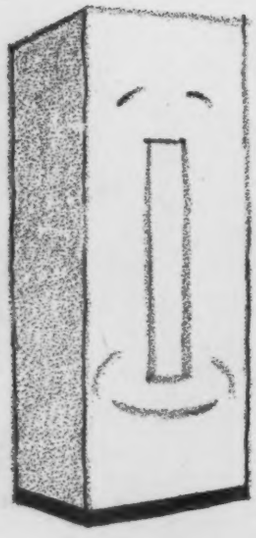
"Stuff" to Know

Dishwashers--Health

Strongest reason you have for the dishwasher is sanitation. But you want it to work positively rather than drive your prospect away in fear. The way folks react to the fear appeals are not always as anticipated. It is better to turn the germ story around into the more positive one of sanitation and health benefit than to try to scare people into buying—you hope. Tell how health and happiness will be guaranteed because the fear of germs will be removed.

Tell how health requirements call for sterilization of doctors' instruments in water of high temperature, how milk is pasteurized too by heating it to 140 deg. F. for 20 minutes. To assure the safety fo family health the dishes out of which the family eats deserve the same treatment. But the hands cannot stand temperatures over 80 to 110 deg. At such temperatures germs breed fastest. At dishwasher temperature—140 to 150 deg.—germs are killed. Sickness from one cannot be carried to another in the family by dishes so treated.

Another of the strongest reasons for buying that you can offer is this: The pleasure of entertaining is not marred by dread of the stacks of dishes afterwards, the horror of breaking valuable china or glassware. Meals taste better, appetite is keener to a woman who does not face dishwashing afterward. Children and husbands who help feel the same.



Keep in Hot Water too

Behind every dishwasher must be a source of really hot water, and a logical combination of it with a water heater for an electric kitchen is natural. With electric, carefree, safe and certain hot water service and a dishwasher the kitchen loses all of its hard tasks, becomes instead a room for true living at its best.

Coffee Makers--June Brides

Traffic appliances they are called, and for a good reason—they bring traffic to your store. Reason is that coffee is a daily necessity to practically all families in America. Everyone makes coffee in some fashion or other. Therefore they make an ideal June Bride gift appeal.

Coffee drinkers are an experimental lot too, trying new methods as well as new brands of coffee. There is a constant market for coffee making devices. Electric coffee makers—either the standard percolator, the glass coffee maker, or the metal coffee maker, offer a variety of devices to sell to a variety of tastes. The glass coffee makers also furnish a brisk replacement business from natural breakage.

Taste and flavor are what people seek, and what they buy in a coffee maker. Your selling is easy if you help the prospect decide that it is easier, more certain, and that she gets better tasting coffee with an electric device.

Here, in case you've forgoten them for the mere mechanical details, are the **real advantages** of electric coffee making: "Controlled heat means perfect coffee every time, full richness without boiling. You can use finer grinds to extract richer flavor. The aromatic oils that give the tempting aroma are released into the coffee. The coffee maker makes possible service right at the table. It is attractive and decorative in any setting.

"Stuff" to do

Prime Subjects

Reminder to customer-movers

The problem of getting range customers to notify the utility company in advance of moving in order that wiring arrangements may be made in the new location is being met by the Southern California Edison Co. with a series of recipe cards sent monthly to this class of consumers. On the back of each card is a reminder of the desirability of notifying the Edison Co. before moving or building a new home, for the sake of convenience and the assistance which the power company provides in installing wiring for a range or water heater.

The cards are distributed with ELECTRICAL TIMES, which accompanies monthly service statements. The series was inaugurated in November with a two-fold card containing menu and recipes for a holiday dinner. It is planned to use single cards in the future. The company anticipates that this policy will help stop load losses due to range owners moving to an unwired home.

● SHIRAR-YOUNG REFRIGERATION CORP. branched out into retail distribution with the opening of a new retail store at 1616 J Street, Sacramento, according to J. M. Johnson, manager. Formerly a distributor of commercial refrigeration equipment at 1511 K st., the company expanded into the home appliance field with refrigerators, ranges, washers and ironers and other major appliances.

● NEVADA BETTER HOUSING EXPOSITION held at the State Building in Reno from Mar. 26 to 30 found in it exhibits from all of the electrical dealers in Reno and surrounding territory. In fact, the electrical displays dominated the housing exposition. Among the dealers exhibiting were H. E. Saviers and Sons, Good Housekeeping Shop, Linnecke Electric Co., Howell Electric, Silver State Appliance Co., Nevada Machinery and Electric Co., Savage and Sons.

● TENANTS OF LOW-COST HOUSING units are not necessarily minimum customers according to the experience of the Southern California Edison Co. When average monthly revenue in a large tract of low-cost homes adjacent to one of the Southern California aircraft factories approximated $2.50, a survey of 100 homes was made to determine appliance usage. The 100 homes contained 51 electric refrigerators, 2 ranges, 70 washers, 97 radios, 1 ironer and 2 mixers in addition to lights. The houses were 4½-room single family dwellings with no garage designed to sell at an average price of $2,200 including lot.

● ELECTRICAL RETAILERS and wholesalers united in a big breakfast at the Hotel Georgia, Vancouver, B. C., last month to launch the spring refrigerator campaign sponsored by the Home Appliance Council of the Electrical Service League of B. C. E. A. Lowden, manager merchandising department, Canadian Westinghouse Co., was the guest speaker, arranging his western visit from his head office to coincide with the event. W. Husband, chairman of the refrigerator committee of the Home Appliance Council, and J. Lightbody, publicity chairman of the Council, presented final details of the drive.

● THE James B. Black trophy for outstanding sales achievement during 1940 was won by the Humboldt division of Pacific Gas and Electric Co. The trophy consists of a beautifully mounted silver plaque and is retained by the winning division until another division is declared winner.

Award of the trophy is an annual event throughout the P. G. and E. sales organization. Basis of the award is the best sales record in load building and control of sales expense.

In winning the 1940 Black trophy, the Humboldt division narrowly defeated both the Shasta and San Joaquin Power divisions. Past winners have been the Shasta division in 1937, the San Jose division in 1938 and the North Bay division in 1939.

● DEALER PUBLICATION—"*Home Appliance Counsellor*" is now being issued by the Dealer Sales Promotion department of the B. C. Electric Railway Co. and is distributed to all electrical dealers and contractors in the area served.

Recipe Cards

Sales managers vote for these

"What do sales managers want to hear about?" H. C. Rice, Southern California Edison Co., as program chairman of the Los Angeles Sales Managers' Assn. sent a questionnaire to all members of that group with a list of suggested subjects.

In the order of their vote, the following relative importance was placed upon the subjects: First, "Better ways to supervise and control salesmen in the field." Second, "Ideas that will put more pep in your sales meetings." Third, "Sales contests." Four subjects tied for fourth place; namely, "Important trends in compensation of salesmen," "The sales manager's job under changing conditions, including war," "The place of advertising in the sales campaign," and "Are salesmen through at 40?" Least voted for was "Consumer cooperatives," evidently indicating a lack of worry over them.

● THE SALT LAKE Tribune and Telegram's "American Way" electric cooking school at the Hotel Utah drew thousands of housewives during the three-day session in Salt Lake City, April 2-4. Dealers and distributors of the Electrical League of Utah tied in with extensive newspaper and radio advertising with a patriotic theme, the Institute featured American recipes—foreign foods and dishes being entirely eliminated. Cooking contests were a specialty of the school which concluded [illegible] an illustrated fashion show in which Milton Caniff, internationally known fashion authority was the headliner.

Home Economics department of Putryzcki high school, Dayton, Wash., modernized with five new electric ranges and an electric refrigerator. The sewing room has four electric sewing machines, an ironer and a roaster. Pacific Power & Light home service advisors often assist with demonstrations of appliance use and home lighting

ELECTRICAL WEST

McGRAW-HILL COMPANY OF CALIFORNIA
68 POST ST. SAN FRANCISCO

The all-industry magazine of progress, established 1887 and incorporating the "Electrical Journal," "Journal of Electricity, Power & Gas" and "Journal of Electricity." Contents Copyrighted

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A "Defense" Masquerade

SPEAKING before a Congressional committee recently, OPM Production Manager John D. Biggers said that the biggest obstruction to the national defense program is "a lack of understanding of the magnitude of the job." He might have added that the worst offenders are those who think that reform and punitive oppression of business and industry are still part of the political program. Strange indeed are the schemes which today are being cloaked in the guise of "national defense." Most of these are obvious political ruses either to stifle opposition or to fool the public.

The continued attack against the electric utilities is typical of these tactics. Here, as in other fields, the patriotic zeal of the American people to aid the democracies is being exploited by a group who insist upon making of the utilities a New Deal whipping boy. It matters not that subterfuge is involved. Nor do the zealots count the ultimate cost. They would embarrass, supplant or destroy legitimate tax-paying business organizations solely to further a doctrine that is the extreme opposite of American democratic principles. And to what purpose? To reduce the cost of electric service to the home a few cents a month? Bosh! There are a score of places where greater savings to the average citizen might be achieved. The item of taxes—due for the greatest increase in history—would be a good starting point.

Just how long the American people will put up with the hypocrisy that is masquerading under the cloak of national defense is a matter of conjecture. Probably until some forthright member of Congress has the courage to label the tactics for what they are and call a halt.

Power Paradox

AMERICA is a land of paradoxes. We read on the one hand that the SEC has definitely started the disintegration of utility holding companies. In the same news is a report that a division of power has been set up in the Department of Interior to unify and direct the huge power undertakings of the federal government. The utilities are paying the penalty for bigness through legislation that was enacted when bigness was synonymous with badness. The federal power undertakings have reached a size where it is necessary that direction be concentrated in one place. At the end of 1940, the USBR had 25 plants operating with 871,71 kw. installed. An additional 1,042,-100 kw. is under construction. Ultimately the Bureau will have 43 widely scattered plants (not integrated) with a total of 4,568,342 kw. installed —the biggest power organization in the world. Carter Field says in a recent issue of *Electrical World*, that the new administration theory is: "Bigness is bad—unless *we* run it."

Some Needed Perspective

IT'S about time the people of the Pacific Northwest viewed the Bonneville situation in something approaching its true perspective. If enough publicity could be given to the recently issued Bonneville report on 1940 operations, the public might grasp the real relationship between the economic and financial aspects of the project and the social planning phases. Certainly the public ownership elements of the undertaking would be set forth in a manner that might occasion some serious questioning as to the value and importance of the government ownership activities fostered by Bonneville.

According to the report the Bonneville administration sold 329,728,550 kwh. for $749,118.29 in 1940. Of these amounts the Portland General Electric Co. took 223,120,531 kwh. and paid the federal government $509,575.77 — approximately

68% of both energy and revenue. Bonneville's industrial customers—principally the Aluminum Co. of America—used 95,176,100 kwh. and paid $196,447.27—28% of the energy and 26% of the revenue. Less than 4% of the power produced and less than 6% of the revenue received came from the twelve public agencies—municipalities, PUD's and cooperatives—that Bonneville served last year.

So we say that the people of the Northwest have not been given a true perspective of the relative importance of Bonneville's sales. In fact they have been kidded. The 50% of its capacity that was to have been reserved for public agencies has been sold. Fortunately the purchasers have been organizations that will ultimately mean far more to the economic welfare of the region than all of the PUD's and municipal utilities that Bonneville will ever serve. But someone ought to tell the public about it.

Send These Strays Home

ELECTRICAL requirements of national defense are jeopardized by a simple oversight of many organizations in the industry. In utilities' warehouses and stores departments, in wholesalers' yards and in contractors' storerooms are thousands of cable shipping reels, spools and containers—lying empt yand forgotten. In the meantime wire and cable manufacturers are faced with an acute shortage of these shipping essentials, mainly because busy customers have failed to return these empty containers. The resultant shortage threatens deliveries on vital defense orders. While new containers are being bought and made in large numbers, the quantity is far short of adequate to meet the urgent requirements of defense. More containers are needed quickly. If customers will return all empty reels, spools and cases so that these may be put to work at once, they will contribute doubly to the defense effort: (1) Wire and cable shipments to vital defense projects will be expedited. (2) Time, materials and labor required to build new containers will be conserved for other defense purposes.

Rainbow of Promise

CALLING the spectrum in its entirety a "Rainbow of Promise" to which the human photoelectric cell, the eye, is tuned to but a very narrow wave band, Sam Hibben projected the knowledge of today into the possibilities of the future and widened the horizon of illuminating engineering far into the shorter and longer wave bands. Lighting has reached into the fringes of these outer bands—infra-red for heat applications and photography, ultra-violet for fluorescent lamps, decoration, artificial sunshine and sterilization. But the spectrum reaches still far beyond these into x-rays and cosmic rays.

Such extended horizons bring increasing need for engineering of applications. Just how far the illuminating engineer should extend into them is not easily determined. At least before him he can lift his eyes and see potentialities unlimited. Indeed progress in the art has been so rapid within the last decade that lighting design is no longer the simple thing it was under a single light source.

Realization of such a widened horizon makes a lighting conference such as that held last month in San Francisco a necessity. While the individual lighting salesman may have limited need for the full spectrum of lighting applications reviewed there, it is essential today that he be aware that they exist and thus be able to locate information concerning them if need arises. A refreshed glance at the entire rainbow of promise occasionally to stimulate his imagination and initiative is a tonic that it is well for him to take each year at least.

"*AGAIN—and again—and again the financial and managerial components of our Free Enterprise System must prove, by deeds as well as by words, their full comprehension of their social responsibilities—their deep sense of public service—and their unmatched capacity to plan positively—to put into effect—and, if you will, to police, by self-imposed rules, a constitution for industrial and commercial progress acceptable to the majority of our people—people whose economic security and destiny are vitally affected by the decisions of these controlling components of the system. And in the circumstances surrounding us today, who will doubt that this action must be prompt and positive, and of a character which will demonstrate, beyond the chance of successful challenge, that the public-spirited people administering private enterprise inherently and actually excel the people comprising political organizations—no matter how sincere the intentions of the latter may be—as instrumentalities for insuring an ever increasing measure of economic freedom and security for all of the people—save the indolent—all of the time.*"—Charles E. Wilson, president, General Electric Co.

Power Piler Really Stacks Those Stacks

An electrically-operated potato piler, developed by P. Knudsen of Aberdeen, Idaho, owner of Aberdeen Hardware Co., will pile 220 sacks of potatoes in ten minutes. Four men are required to aid in the operation of the piler, which stacks to a height of twelve feet.

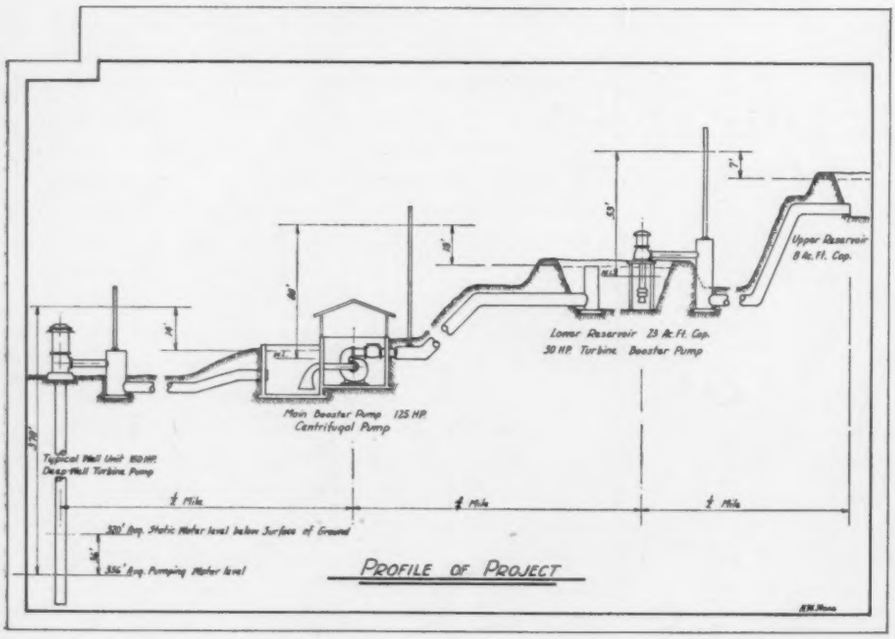
The elevator itself can be revolved nearly 180° without moving the wheel support, and the machine so counterbalanced that it can easily be handled by one man. The piler can be trailed behind an automobile. Measurements of the piler are 16 to 18 ft. in length, and 20 in. inside elevator width. Three speeds forward are available, and the equipment is powered by a 1-hp. motor, transmitted by an old automobile transmission. Fifty of these pilers are now in use in potato cellars in and around Twin Falls, Idaho.

ABOVE: Frnot view o felectric piler, showing drive and suspension.

●

BELOW: Rear view of Knudsen piler—note counterbalance (lower right), and operating mechanism.

Profile below shows schematically project described in thi sarticle by H. Wayne Stone of PG&E Bakersfield staff. Amount of water used (3½ acre-feet per acre per year) would cover entire 600 acres to a depth of 42". With yield of 30,000 lbs. of potatoes per acre, water weight to produce would be 9,500,000 lbs. per acre or 316 to 1.


Upper Reservoir
8 Ac. Ft. Cap.
Lower Reservoir 23 Ac. Ft. Cap.
30 HP. Turbine Booster Pump
Main Booster Pump 125 HP.
Centrifugal Pump
Typical Well Unit 150 HP.
Deep Well Turbine Pump
¼ Mile
¼ Mile
¼ Mile
320' Avg. Static Water level below Surface of Ground
336' Avg. Pumping Water level
PROFILE OF PROJECT

Irrigation

Low rates—rich lands

By H. WAYNE STONE
PG&E, BAKERSFIELD

Low electric power rates in San Joaquin Valley, Calif., provide economical irrigation for rich upper mesa lands, formerly lying fallow and semi-arid. A 600-acre, 3-well development recently completed is of interest: wells 14-in. diameter; 500-600-ft. depth, casing double No. 14 red-steel welded. Average static water level 320 ft., total production 5000-gal. per min. Pumping units consist of deep well turbine-type directly connected to 150-hp. electric motor and connected, through concrete pipe lines, into booster pump sumps ½-mi. from water producing area. Well units operate against average total pumping head of 378 ft., including pressure head necessary to offset friction in pipe lines and elevation rise.

Booster installation comprises two-stage centrifugal pump directly connected to 125-hp. electric motor. Total head against booster 88 ft., including friction head from ¾ mi. of 22-in. pipe line, terminating in reservoir of 23-acre capacity. This reservoir is located to serve 400 acres by gravity flow.

Remaining 200 acres, at higher elevation, is served by turbine-type booster pump directly connected to 30-hp. electric motor. This plant pumps out of reservoir through ½-mi. of line, against head of 53 ft. delivering into reservoir of 8 acre-ft. capacity.

Contour of upper land permits retrieving all tail water for lower fields. If sufficient quantities of tail water are available to justify installation of retrieving pump at extreme lower end of field after initial seasons operations, it will be made. Such installation would include a collecting reservoir and float switch controlled 10-hp. electric motor directly connected to turbine-type booster pump.

Total ultimate load is 615 hp. (1-hp. plus per acre). Estimated average water use per acre per year is 4 acre-ft., which results in load factor of 30 percent. With normal seasonal rainfall (6.5-in.) for San Joaquin Valley, water use per acre will approximate 3.5 acre-ft. per acre per year.

● THOUSANDS OF EGGS in electric brooders were saved at Bauer, Utah, by rapid repair of a broken line by Utah Power & Light linemen. Carrying 44,000 volts, the line snapped when it became ice-laden during a dense fog. Poultry men were attempting to rig up temporary heaters when the power was restored after a 54-min. breakdown.

Northwest Commercial Problems Studied

National defense emergency finds utilities ready to serve any and all loads as customer use grows and sales reach new high records

BOWNESS

ALLISON

COLLINS

EMERGENCIES of national defense should preclude further controversy over public versus private operation of power facilities in the opinion of speakers before the sixteenth annual meeting of the Northwest Electric Light & Power Assn. Business Development Section in Spokane March 27-29, held under the chairmanship of D. B. Leonard, sales manager, Pacific Power & Light Co. Such costly and wasteful activities as condemnation suits and special elections are diverting manpower and resources from the more pressing problems of defense preparation, according to S. P. McFadden, vice-president, Puget Sound Power & Light Co.

Contrasted with this is the way all utilities, private and public alike, are tying in to defense activities in Canada as discussed by E. W. Bowness, vice-president, Canadian Utilities, Ltd., Calgary. There rivalries and differences have been swept aside and every effort is being put behind defense, even to the point of building facilities on which the expected return might not justify the capital investment required. He declared that the slogan, "business as usual," has been forgotten temporarily.

That the power industry will not be a defense bottleneck was the declaration of George H. Wisting, assistant general manager of Northwestern Electric Co., who showed by charts and maps that America has 4½ times as much power as it had in 1917 and substantially greater mobility because of system interconnections. Kinsey M. Robinson, president, Washington Water Power Co., made a plea for actual and active cooperation between Federal and private utility power plants in the region so that the defense program might not be impeded.

The last general session on Saturday morning closed with two powerful speeches, one by Eric A. Johnston, Columbia Electric & Manufacturing Co., Spokane, and former director of the U. S. Chamber of Commerce, on the effect of defense on manufacture of electrical equipment; the other, an inspirational talk by Kinsey M. Robinson. Pointing out that the volume of strictly defense goods the country is setting out to produce will cut into the present normal volume of peace-time consumer goods, Mr. Johnston emphasized that manufacturers, and consequently distributors and dealers, would have to adjust themselves to inevitable changes.

Mr. Robinson told the group that the industry in the Northwest in order to survive would have to gear itself to furnish increasing service at ever decreasing rates in spite of the ever increasing expense of taxes and other uncontrollable items. This, he said, places the heaviest portion of the burden on sales departments. "Government has set up a so-called yard-stick," he said. "Our industry is now fighting for the opportunity to prove its ability to make a better showing under private enterprise than the T.V.A. is making in its yard-stick area."

Sandwiched between these general sessions were bureau and committee conferences extending over one and one-half days. Spirited discussion on the merits of various types of advertising as winners of good will took place in the conference of the advertising bureau under J. Harvey Leach, Puget Sound Power & Light Co., chairman. Several of the utility advertising directors and agency men present questioned the effectiveness of written institutional advertising in winning friends for the company. K. I. Jack, The Washington Water Power Co., urged a concerted effort on the part of member companies to check and evaluate their work in this respect periodically by a poll of public opinion directed by an outside agency.

A plea for the simplification of the advertising story both in theme and in wording was entered by Ashton B. Collins, creator of Reddy Kilowatt. Instead of directing advertising to the intellectual few, the copy should be phrased to appeal to the masses of the people who are swayed more by emotional appeal.

D. J. McGonigle, The Montana Power Co., chairman of the residential sales bureau, brought his two committees, home modernization and home service, together for joint session on one afternoon. Potent brevities from the presentations of the speakers were as follows: "Avoid wasting energy on non-productive activities. Put your time and effort on those things that will produce business for your company."—Dr. George W. Allison, Modern Kitchen Bureau. "Customer relations are the responsibility of all employees. The good done by salesmen and home service advisers in selling the company to the customer can be totally destroyed by an idle remark from an employee in another department."—R. B. McElroy, The Washington Water Power Co. "The home service department is an important factor in any company's load building program."—Lucille Ramirez, The Washington Water Power Co. "Full cooperation of the utility company's home service department with dealers has resulted in an increase of load building appliances on the utilities lines in 1940 over 1939 to the extent of 181 per cent in the case of electric water heaters, 151 per cent in electric ranges, and 118 per cent in electric refrigerators."—C. E. Hess, Puget Sound Power & Light Co. "The utility is in a better position to encourage and give assistance to dealers

LEONARD

if it remains in the merchandising business."—Eric A. Johnston, Columbia Electric & Manufacturing Co. Carrying the cost of range wiring on the utility company's service account and more assistance in sales training of dealer sales personnel were among the co-operative activities advocated by V. J. Morris, a Spokane dealer in electrical equipment. "Analyze your customers by classes based on use of service and concentrate sales efforts on those customers that will increase their use in the higher steps of the rate."—R. O. Kerr, The Montana Power Co.

In subsequent meetings of the home modernization committee under Frank A. Tool, The Washington Water Power Co., chairman, lighting, cooking and water heating were discussed from the standpoint of customer comfort and profitable load by G. B. Hain, Westinghouse Lamp Division, A. C. McMicken, Portland General Electric Co., and Earl A. Olson, Idaho Power Co., respectively.

The home service committee program under W. A. Huckins, Utah Power & Light Co., chairman, brought into the picture the work of the home economics departments of federal and state agencies and state colleges. Representatives of local contractors and architects and the Better Housing Bureau talked on planning modern homes and kitchens.

Necessity for aggressive leadership by utility lighting sales departments in selling fluorescent lighting to commercial customers was emphasized in the bureau meeting of the commercial and industrial group under A. H. Greisser, Portland General Electric Co., chairman. C. T. Bakeman, Puget Sound Power & Light Co., pointed out that early installations of fluorescent were inferior in many respects. He urged a survey of existing installations by each company coupled with an aggressive campaign that would produce the maximum benefits of this new light source for the customer and adequate lighting revenue to the utility.

This group also devoted part of its conference to commercial cooking and heating laying stress on the desirability of cooperation with restaurant, bakery and hotel associations for the promotion of the idea of the many benefits of electric cookery. Arc-welding machine characteristics and power factor improvement were among the subjects considered in the industrial power section of this bureau conference.

How the farm promotion organizations of utility companies could cooperate with the various youth movements in rural areas engaged the attention of the Rural Sales Bureau, Ben W. Faber, Portland General Electric Co., chairman, during one entire session of its bureau conference.

NW Engineers

Study maintenance, system operation and load forecasting

BY zoning rates and lowering those that are entitled to be lowered on the basis of cost of service, the Portland General Electric Co. hopes to meet the competition of public ownership in its territory, James H. Polhemus, President, told the 200 engineers and operating men gathered for the 18th annual general meeting of the Engineering & Operation Section of the Northwest Electric Light & Power Assn., Portland, Ore., April 16-18, 1941. Polhemus' talk opened the meeting shortly after the call to order by Paul P. Ashworth, Telluride Power Co., chairman of the Section.

"Portland General Electric Co. can not adhere to the principle of postage stamp rates if the public will not recognize it," said Polhemus, "and to-date all P.U.D.s and municipalities distributing Bonneville power have adhered to the surcharge principle, that is, placing a surcharge upon the standard Bonneville rates in accordance with the varying costs of doing business in each community." Mr. Polhemus continued that they hoped to meet this competitive situation by stream-lined operation, aggressive load building and cutting costs in every possible manner.

In recognition of the increasing importance from the national defense standpoint of the complete physical integration of the inter-connected power net-work of the Pacific Northwest, made up chiefly of 11 extensive private utility systems, two papers bearing on this inter-connection appeared in the programs of two different communities. In the Power Production Committee, of which E. H. Collins, The Washington Water Power Co., is chairman, F. S. Beale, Idaho Power Co., presented a study of maintenance practices by the inter-connected companies with principal emphasis on the schedule followed by each in taking water wheels and generators out of service for inspection and repair. Discussion on this paper brought out that company maintenance schedules should be coordinated with each in an attempt to stagger the time for taking the large generating units in the area out of service, so as to have a maximum reserve capacity on the line at any given time.

A study of inter-connected system operation and automatic control was presented in a paper by R. E. Pierce, Ebasco Services, Inc., under the Electrical Equipment Committee, chairmaned by J. Hellenthal, Puget Sound Power & Light Co. The paper offered three general principles: (1) contractual relationships should promote the greatest possible freedom in operating procedure with the highest efficiency of physical facilities in each company; (2) each major system should assume its equitable portion of the responsibility of frequency control for the entire group; (3) each major system should provide automatic control of the net interchange on all interconnections between itself and its neighbors. Finally the paper pointed out the extreme importance of the necessity of having automatic control equipments on the various systems not only capable of but adjusted for coordinated functioning. In discussion of this paper, there was general agreement that each company should "put its own house in order" as far as its governing and control equipment was concerned, and should assume responsibility for controlling its own frequency.

In a study by the Power Production Committee, J. MacEwell and P. D. Jennings of Puget Sound Power & Light Co., outlined the factors involved in determining the amount of steam power required to supplement the hydro power of the region. Offered as a discussion of this subject, R. M. Wilson, The Washington Water Power Co., explained the method in use in that company of forecasting power requirements by load duration curves which were indicative of the time and duration for drawing down water storages as well as of the amount of steam auxiliary that would be required for a certain period in the future.

In the Transmission & Distribution Committee, under R. J. Davidson, Pacific Power & Light Co., M. F. Hatch, The Washington Water Power Co., explained a new method for estimating secondary loads from a study of the kw.-hr. supplied to the customers on given feeders. The method was advocated as a simple, adequate and inexpensive way of determining when secondary feeders and transformers were becoming dangerously over-loaded.

Laying the third-13 kv. submarine cable for 22,000 ft. across Puget Sound with water depths in excess of 700 ft. was the subject of a paper by D. F. Misz, Puget Sound Power & Light Co., also a report of the Transmission & Distribution Committee. The laying procedure was illustrated by a colored movie descriptive of each process, taken by The Okonite Co.

An interesting progress report, with a demonstration, of the emergency radio communication in use by Portland General Electric Co. was presented by W. A. Leidigh, Jr. as a part of the Electrical Equipment Committee report. Use of

this equipment in shooting trouble has proved a time-saving and economical development in the company's communication system. E. T. Vickerman and S. E. Edelstein, The Washington Water Power Co., collaborated in the authorship of a paper describing a new high speed condenser timer developed by them for testing relays.

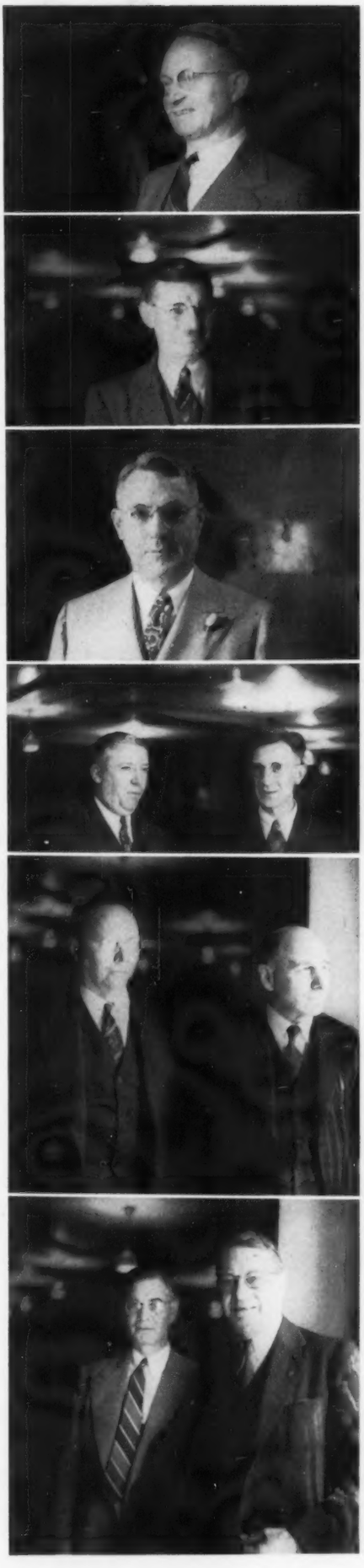
The Accident Prevention committee under D. W. Prairie, Northwestern Electric Co., chairman, had a round table discussion on safety methods leading to the general consensus that employe training was the key to decreased accidents. Chester Coon, Safety Live Line Tool Co., showed moving pictures illustrating the use of Live Line tools for the maintenance of high voltage lines.

Highway lighting progress in the territory was reported by F. H. Murphy, Portland General Electric Co., as a part of the Utilization Committee with John Bankus, Portland General Electric Co., chairman. The effect on distribution systems of fluorescent lighting and the progress in obtaining power factor correction of this and of all gaseous tube lighting were other subjects in this program, contributed to by J. F. Emery, Idaho Power Co.; Hilbert S. Johnson, Portland General Electric Co.; and Paul L. Marble, Puget Sound Power & Light Co.

A. B. Campbell, Edison Electric Institute, told the group of joint studies of engineering problems affecting utility companies and manufacturers and of proposed changes in the National Electrical Safety Code. Fred C. Holtz, Sangamo Electric Co., described the making of synthetic sapphires for meter and watch jewels as a substitute for the natural jewels, most of which formerly came from Europe.

Among the inspection trips offered to delegates were trips to the Bonneville project on the Columbia River, 40 miles west of Portland, and to the Ampere Substation of the Bonneville Administration at Vancouver, Wash., large terminus of the 230-kv. double circuit "back-bone" line from Bonneville, from which branches extend north, south and west. H. H. Schoolfield, Pacific Power & Light Co., was general chairman of arrangements.

Northwest Engineers



Top to bottom and left to right: Paul P. Ashworth of historic Telluride Power, headed the section; E. H. Collins of Washington Water Power; J. H. Polhemus, president, Portland General Electric; Ed Sixtus, Pacific Electric Mfg. Co., and F. M. Lewis, US Army Engineers; Walter Brenton, Portland General Electric and E. H. LeFever, Northwestern Electric; Tom Wood, Seattle, and H. H. Schoolfield, Pacific P. & L.

Inspectors

Discuss non-tamperable fuses at northern California meeting

Non-tamperable fuses for circuit protection according to the 1940 Code provided the chief topic of discussion at the April 16th meeting, Northern California chapter, I.A.E.I. at San Francisco city hall. E. H. Snedaker, chief electrical inspector, San Jose, presided as chairman. Otis W. Newcomb, president of the Southwestern Section and chief electrical inspector, Long Beach, made a special trip to be present at the meeting.

Since Oakland has adopted the 1940 Code, Ben Hill, superintendent of its Department of Electricity, was asked to lead discussion on it. Deferment in the requirement of type RH wire was permitted, he said, because of the lack of availability of the wire on the market. From this the discussion led into circuit arrangements under the new code and from that to a discussion of non-tamperable fuses. After considerable discussion, a resolution was passed urging national manufacturers of fuses to hurry the standardization of non-tamperable current limiting devices so that the 1940 Code provisions may go into effect as scheduled in November.

An interim interpretation of the Code relative to applying correction factors both for wires in conduit and for temperature was explained to mean that only a single correction factor need be applied where more than three conductors are run in conduit.

Tribute was paid to Carl Heise, veteran member of the executive committee of the Southwestern Section who recently retired from Westinghouse Co. He plans to remain active in inspector association affairs. Next meeting of the chapter will be held either in San Francisco or Sacramento depending on the availability of a boat for a joint boat-ride with the contractors' association, some time in June.

Intermountain group elects new officers, learns of AW program

Electrical inspectors from Colorado, Wyoming and South Dakota assembled in Denver, Mar. 27-28, for the seventh annual inspectors' school conducted by Rocky Mountain chapter, Western Section, of the International Assn. of Electrical Inspectors. At conclusion of the two-day session, George R. Hubbard, Boulder, Colo., was elected chairman; Marion Wilson, Rapid City, S. D., first vice chairman; Charles B. Farrah, second vice chairman, and Victor C. Moul-

ton, secretary-treasurer. William H. Herold, Fort Morgan, Colo., the retiring chairman, and V. D. Markham, Colorado Springs, were elected to the executive committee, replacing G. F. Wallis, La Junta, Colo., and Farrah, Denver's assistant chief electrical inspector, whose elevation to a chairmanship left his post on the committee vacant.

Gaylord B. Buck, vice president and general manager of Public Service Co. of Colorado, keynoted the meeting. Showing of the movie film "Approved by the Underwriters," presented by B. P. Caldwell, Jr., assistant secretary of Underwriters Laboratories, Inc., Chicago, was attended by Denver's fire prevention bureau Chief Patrick J. Boyne and associates.

Ralph Johnson, chairman of the contractors' division, Rocky Mountain Electrical League, addressed the inspectors on provisions of the new national electrical code, stressing a greater need for adequate wiring and issuing a warning to "watch voltage drop." Austin Dunham, district manager of Anaconda Wire and Cable Co., spoke on "Wire Insulations in the 1940 Code as They Affect Adequate Wiring—How-Why-When," delivering the same message presented by M. A. Smedley at the 1940 I.A.E.I. annual meeting in Chicago.

Victor H. Tousley, field engineer of the National Fire Prevention Association and secretary-treasurer of I.A.E.I., presided at a round table code discussion, answering the multitude of questions fired at him by the tri-state group.

Lester B. Johnson, district representative of General Electric Co., Salt Lake City, gave some excellent advice on trouble shooting incidental to "Fluorescent Sockets, Starters and Circuits," pointing out that this phase of the industry is still in its infancy, assuring those present that diminished load factors and consequent mechanical difficulties frequently succumb to a good job of salesmanship.

Southern California chapter has aviation factory wiring as topic

Aviation factory electrical installation methods and the problems of an electrical inspector in connection with them formed the major topic of the day at the March 26 meeting, Southern California chapter, International Association of Electrical Inspectors, Alhambra, Calif. Earl E. Malmgreen, city electrical inspector of Alhambra, and chairman of the chapter, presided.

Larry Trim, chief electrical inspector of Burbank, gave the talk on installations at aviation factories, of which Burbank has many. He stressed the necessity for utilities to furnish alternate sources of power through a loop system.

Anticipating a shortage of zinc for conduit, the question was raised by R. A. Manahan, chief, electrical division, Los Angeles, relative to substitute use of black enamelled conduit. However, manufacturers' representatives present declared there was no immediate necessity for such substitution.

School wiring inadequacy was discussed and recommendations made that the state authorities be contacted urging the requirement of basic adequate wiring, especially in rural schools. A committee was appointed to investigate such conditions and report to the annual convention in San Jose in August.

Next meeting will be held May 21 at Long Beach. Inspectors Larson of Riverside, Bartlett of Inglewood, Lyons of Santa Monica, Byram of South Gate, and Joe Rose, Bureau of Power & Light, Los Angeles, were assigned to appear on the inspectors' problem program.

Canadian Assn.

Convention reviews conditions of wartime electrical industry

Preview of some of the conditions electrical dealers in the United States may face under war conditions could be had from listening to the discussion at the British Columbia convention of the Canadian Electrical Assn., Hotel Vancouver, April 18. It was one of three regional one-day conventions at which G. A. Gaherty, president; B. C. Fairchild, secretary; Prof. C. V. Christie, chairman of the Engineering Section; J. K. Wilson, chairman Utilization and Sales Section; all from Montreal, attended.

W. C. Mainwaring, in charge of merchandising for B. C. Electric Railway Co., went to bat on behalf of electrical dealers to insist that the latter be allowed to mark up not only on cost of appliances but also on the heavy appliance excise tax, amounting to 25 per cent of the cost, so that they may continue to survive in business. Without such a mark up, he said, they would be forced to sell below cost and it would be a question how long dealers could stay in business.

Harmonious dealer, contractor, and utility relationships in British Columbia and contrasting merchandising plans occupied the sales group. Meter and service entrances, fluorescent lighting and selective use of electrical energy were among the topics discussed by the engineering and utilization group. Prsident Gaherty climaxed the meeting with a banquet address, "The Power Industry and the War".

Agenda

Utah Chapter, International Assn. of Electrical Inspectors—Blaine Grey, Chief Electrical Inspector, presented "General Wiring Methods," at April 1 meeting.

"Specific Wiring Methods" by Jack Jacobs was presented at the April 15 meeting.

Electrical League of Utah, Dealer Division. Met with wholesalers and radio repairmen on March 17 to hear details of "Radio Movin' Day" by Eugene G. Pack, Chief Engineer, radio station KSL.

Met April 21 for discussion of "Frequency Modulation" and range and refrigeration sales. W. C. Hollingsworth presided.

Ogden Electrical League—Heard Paul R. Heitmeyer, manager of radio station KLO, give details of Radio frequency change, March 6 and discussion by Reed R. Smith of "National Refrigerator Market Report Blue Book."

April 3 met for discussion of dealer discounts to apartment house owners and building contractors. Appointment of a committee, with Albert P. Boyle, chairman, to work out details of cooking school.

Electric Club of Washington—April 14, Geo. de Sellem, Westinghouse Electric & Mfg. Co., "The Change from Streetcars to Trackless Trollies". April 21, J. D. Hatfield, chief engineer, Station KIRO, "Description of new broadcasting transmitter on Vashon Island."

Electric Club of S. F., April 14—First annual international luncheon honoring China. Broadcast shortwave throughout the Far East by station KGEI. Guests of honor, 9 Chinese students from Stanford and U. C. and Julean Arnold, former commercial attache to China. April 21, Ray Green, engineer, Fostoria Pressed Steel Corp., "Infra-Red for Industrial Drying, Heating and Baking."

East Bay Electric Club, Oakland, April 7—J. Hunter Clark, "Dirty Linen", a talk on the part that electricity plays in the commercial laundry business. Use of invisible ink and "black light" for marking of laundry, etc.

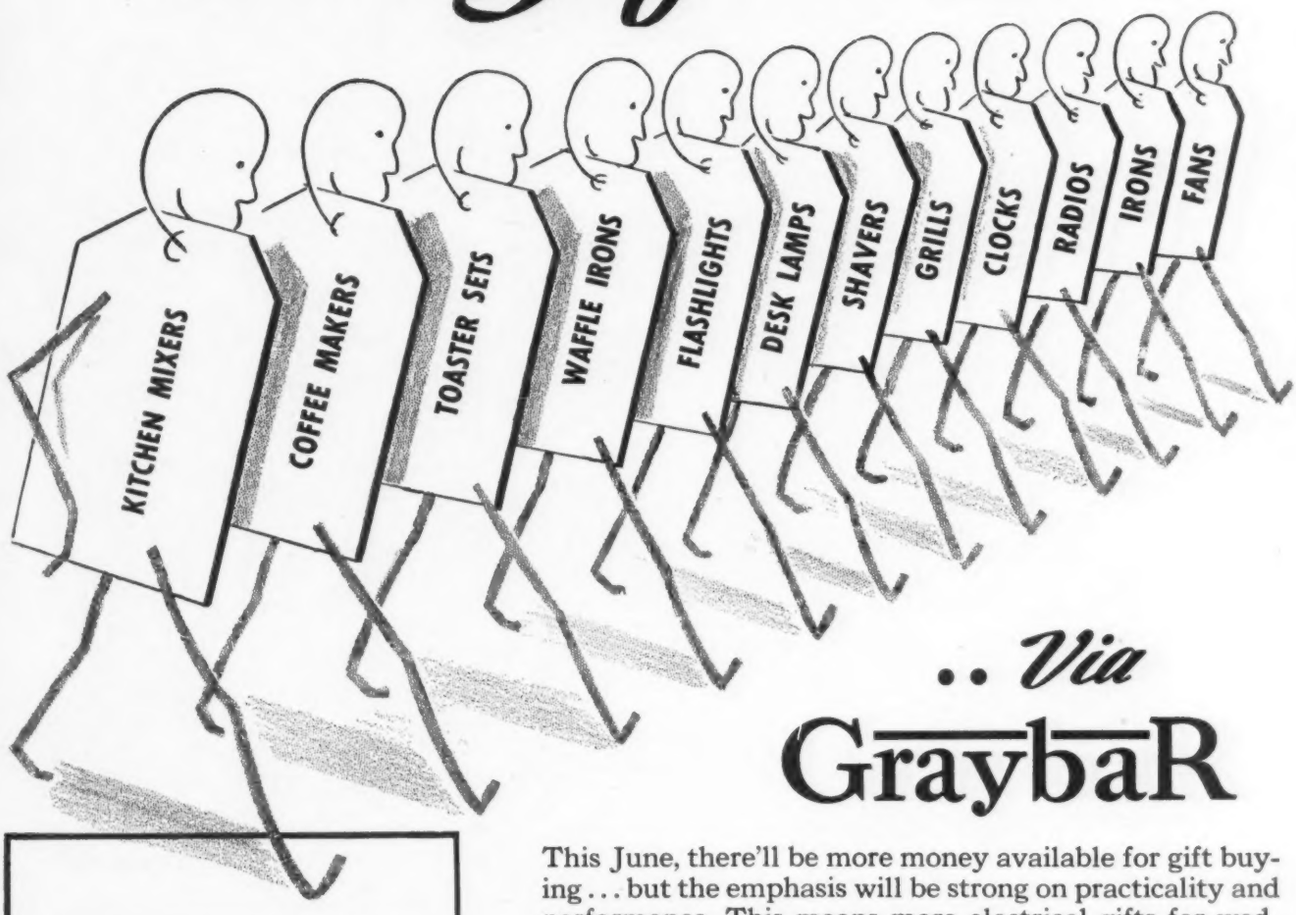
Electrical Estimators, Los Angeles, Mar. 27, Joe Mullenbach, switchboard manufacturer, showed the remainder of his 'round-the-world movies. April 3, A. B. Smedley, Anaconda Cable Corp., special demonstration on the effect of power factor, impedance, reactance, etc., on a wiring system. April 17, R. J. Larrabee, field engineer, Underwriters Laboratories, demonstration of his portable testing truck and trailer.

I.A.E.I. Northwestern Section, annual meeting, Tacoma, Wash., Sept. 2-6; Executive committee held a meeting in April at Tacoma to discuss plans; attended by I. B. Sturges, president, Northwestern Section, chief electrical inspector, Portland; F. D. Weber, secretary treasurer, Portland; William L. Gaffney, vice president I.A.E.I., Tacoma chief electrical inspector; A. J. Newton, chief electrical inspector state of Wash.; E. G. S. Pryor, Washington Surveying and Rating Bureau, Seattle, and Roger Walker, Puget Sound Power & Light Co., Seattle.

Electric Club of L. A.—April 7, annual spring outing and golf tournament. April 14, Dr. Royal W. Sorenson, president A.I.E.E., Cal. Inst. of Technology, and Gov. Julius T. Heil of Wisconsin.

GET "LINED-UP" FOR..

JUNE'S *Gift* PARADE..



..Via GraybaR

This June, there'll be more money available for gift buying... but the emphasis will be strong on practicality and performance. This means more electrical gifts for weddings, graduations and all the rest.

Now's the time to get lined-up for a profitable season with smartly-styled new appliances . . . items that combine eye-appeal with value-appeal . . . products that have only to be displayed to attract new customers into your store.

For a full selection of the most popular sellers, order your appliances "via GRAYBAR". You'll get prompt delivery, along with intelligent help in picking the fast-moving, high-profit items. What's more, you'll have the extra satisfaction-insurance that's guaranteed by the GRAYBAR Tag. Better call your local GRAYBAR house right now.

THROUGHOUT THE WEST
there's a Graybar office near you

Butte	Sacramento
Denver	Salt Lake City
Fresno	San Diego
Los Angeles	San Francisco
Oakland	Seattle
Phoenix	Spokane
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GraybaR QUALITY 1 *Everything Electrical* GraybaR ELECTRIC COMPANY

PCEA Panorama

Edited by Mary Shoop

ELECTRIQUIZ

Are these statements true or false?

1. The electric steam accumulator is a device for storing steam.
2. The term "power factor" is difficut for a person outside the industry to understand.
3. A kilowatt-hour is only a small unit of work.
4. An electric water heater operates all the time.
5. A three-way switch controls lights from three locations.
6. A motor nameplate stamped with 5 hp. 40 deg. C. means that the motor temperature will not be more than 40 deg. C. when the motor is carrying a 5 hp. load.
7. The electric water heater makes more efficient use of electrical energy than appliances such as toasters and mixers.
8. An "electric pig" is a roustabout helper for a lineman.
9. Adequate lighting has no relation to national defense.
10. Bulb snatching is a crime.

Answer on page 88

Pardon, Please

Through an unintentional error in the make-up of the April issue, the first paragraph of the "Who Am I?" article pertaining to Harry L. Harper, Pacific district manager, Graybar Electric Co., Los Angeles, was omitted. This told of his early business experience with Western Electric Co., with whom he started in Kansas City in 1903 as a shipping clerk at $8 a week. He rose steadily in succeeding years, came to Los Angeles as manager in 1919, a year later becoming manager of the company's supply department which in 1926 became Graybar. He was appointed Pacific district manager in 1932.

The Convention

The best in a 24-year line of Pacific Coast Electrical Assn. annual conventions will open at 2 p.m. Wednesday, May 21, at the Hotel del Coronado. A continuous round of convention activities designed to interest, inform and entertain every delegate will continue through Friday night, with the golf tournament scheduled for Saturday morning.

Keyed to the theme, "The Electrical Industry's Contributions to Progress," the program will present prominent speakers, excellent demonstrations and informal group discussions on up-to-the-minute topics. A brilliant social program and enjoyable sports events will round out convention proceedings.

CONVENTION PROGRAM

Wednesday Afternoon, May 21

The Ballroom

Opening session: S. E. Gates, chairman, introducing the theme of the convention, "The Electrical Industry's Contributions to Progress."

2:30 President's address—C. E. Houston.

2:55 For the contractors—Clyde L. Chamblin, manager, California Electrical Construction Co., and past president of National Electrical Contractors Assn. "The Electrical Contractors Contribution to Progress."

3:25 Recess.

3:30 For the manufacturers—E. O. Shreve, vice president, General Electric Co., and president, National Electrical Manufacturers Assn. "The Electrical Manufacturing Industry's Contributions to Industrial, Economic and Social Progress."

4:00 For the utilities—W. C. Mullendore, executive vice president, Southern California Edison Co., Ltd.

Wednesday Evening

Current motion picture at 8:30 in the Ballroom.

Arrangements for informal bridge may be made at the hotel desk.

Dancing in the Circus Room.

Thursday Morning, May 22

Conclaves

Thursday Noon

12:15 Luncheon—"The Destiny of American Civilization." Dr. Paul Périgord, professor of French Civilization, University of California at Los Angeles.
George C. Tenney, chairman.

Thursday Afternoon

Conclaves

Thursday Evening

Motion picture, "Modern Plastics 1940" at 8:30 in the Ballroom, through the courtesy of Monsanto Chemical Co.

Arrangements for informal bridge may be made at the hotel desk.

Dancing in the Circus Room.

Friday Morning, May 23

The Ballroom

K. M. Ryals, chairman

9:30 "Meeting the Power Requirements of Industry." H. V. Putman, manager transformer division, Westinghouse Electric & Mfg. Co.

10:10 "Modern Miracles." Address and demonstration by Dean T. Smith, supervisor public activities, Southern California Telephone Co.; Frank A. Zimmerman assisting.

11:10 Recess.

11:15 "Live Line Maintenance." Demonstration talk and motion picture showing modern technique in handling hot wires up to and including 220,000 volts.
H. W. Tice, manager of operation, Southern Edison Co., Ltd.

Friday Noon

12:15 Luncheon—"Sidelights on the Aircraft Industry in the National Defense Program."
Edgar N. Gott, vice president, Consolidated Aircraft Corp., San Diego.
L. M. Klauber, chairman.

Friday Afternoon

Presiding: President C. E. Houston

2:00 "The Electrical Industry and Radio." Don E. Gilman, vice president, National Broadcasting Co., Inc., Hollywood.

2:30 "What's Ahead for Taxpayers." N. Bradford Trenham, executive secretary, California Taxpayers' Assn.

3:00 "Relationships in Industry." Verne Orr, vice president, Chrysler Motors of Calif.

3:30 Annual meeting.

HOUSTON

CHAMBLIN

MULLENDORE

PUTMAN

You cannot buy better pole line hardware than that which bears the L-M trademark

- it is designed the way you want it
- it is built to last
- it is packed for convenience
- it is shipped promptly
- it is RIGHT in ALL WAYS

LM

LINE MATERIAL COMPANY

ORR

SHREVE

GILMAN

GOTT

Friday Evening

7:00 Cocktail Party given through the courtesy of the manufacturers, manufacturers' agents and wholesaler members of the PCEA. The dining room.

8:00 Banquet and show in the Ballroom—followed by dancing in the Circus Room.

Saturday Morning, May 24

9:00 Golf at Coronado Country Club.

Ladies Entertainment

Wednesday afternoon—3:30—informal tea in Crown room.

Thursday morning—9 to 11:30—boat trip around the bay.

Friday afternoon—talk by Mrs. Belle J. Benchley, curator, San Diego Zoo, in the Gold room.

PCEA Convention Committee

Joseph A. Long, Convention Chairman
G. H. P. Dellmann, Program Manager

Attendance—Roy N. Phelan, chairman; Ralph A. Hopkins, R. E. Fisher, Allen Jones, Loris Auld, L. M. Klauber, R. R. Walbridge, Leon Heseman, J. Clark Chamberlain.

Banquet—W. H. Robinson Jr., chairman; Ray C. Cavell, W. P. L'Hommedieu, George Rankin.

Golf—H. S. Warren, chairman; W. G. B. Euler, K. B. Ayres, F. C. McLaughlin, W. L. LeBarr, R. N. Dreiman, W. J. Wilt, Lloyd E. Henley.

Hotel—Alfred May, chairman.

Ladies Entertainment—Lane D. Webber, chairman; A. E. Holloway, J. H. Pengilly.

Publicity—H. W. Hayes, chairman; F. M. Raymond, W. A. Cyr, J. A. Corlett.

Reception—Stanley W. Scarfe, chairman; S. P. Larsen, B. D. Haugh, C. W. Goodwin Jr., Ray A. Edwards, W. E. Cranston Jr., R. R. Cowles, C. P. Altland.

Registration—A. D. Brown, chairman; C. C. Potts, W. E. Guy, H. G. Dillin, H. D. Conklin. I. W. Borda, M. S. Barnes.

Transportation—G. A. Campbell, chairman; E. A. Crellin, C. D. Weiss, W. E. Frazer.

Ushers—R. Graham Holabird, chairman; W. H. Talbott.

The cocktail party on Friday, May 23, will be given by the manufacturers, manufacturers agents and wholesale members of PCEA. All convention delegates are invited to the event which has been planned by a committee headed by Ray F. Gheen, chairman; and including C. H. Thrane, W. D. Howze, H. Q. Noack, F. C. Angle and J. P. Carson.

WHO AM I?

I was born Oct. 19, 1887, on a farm near Colfax, Ind. I attended grade school in Colfax and high school in Logansport, Ind. In 1909 I was graduated in electrical engineering from Purdue University, where I joined the Kappa Sigma fraternity, was active in athletics and was captain of the 1908 varsity football team. Who am I?

After graduation I worked for six months as deputy county surveyor of Clinton county, Ind., then joined the Westinghouse Electric and Mfg. Co. in East Pittsburgh for an apprenticeship course. In 1910 I accepted a position with the San Diego Gas and Electric Co. as salesman in the new business department. I have held the positions of manager of the new business department and superintendent of the commercial department, and I am now vice-president in charge of sales. Who am I?

I helped organize and was the first president of the San Diego Electric Club. I was a member of the board of directors of the San Diego Chamber of Commerce for 14 years, serving as president for one year and vice-president for two. I am a past president of the Pacific Coast Gas Association. I organized the San Diego County Development Federation and was a director of the California Pacific International Exposition. I am now a member of the Southern California Economic Council representing San Diego county, and am a director of the San Diego Community Chest. Who am I?

I am a member of the Masonic Lodge, Rotary Club, Cuyamaca Club, San Diego Club and the Rowing Club. I am married and have two children and my name is: See page 88.

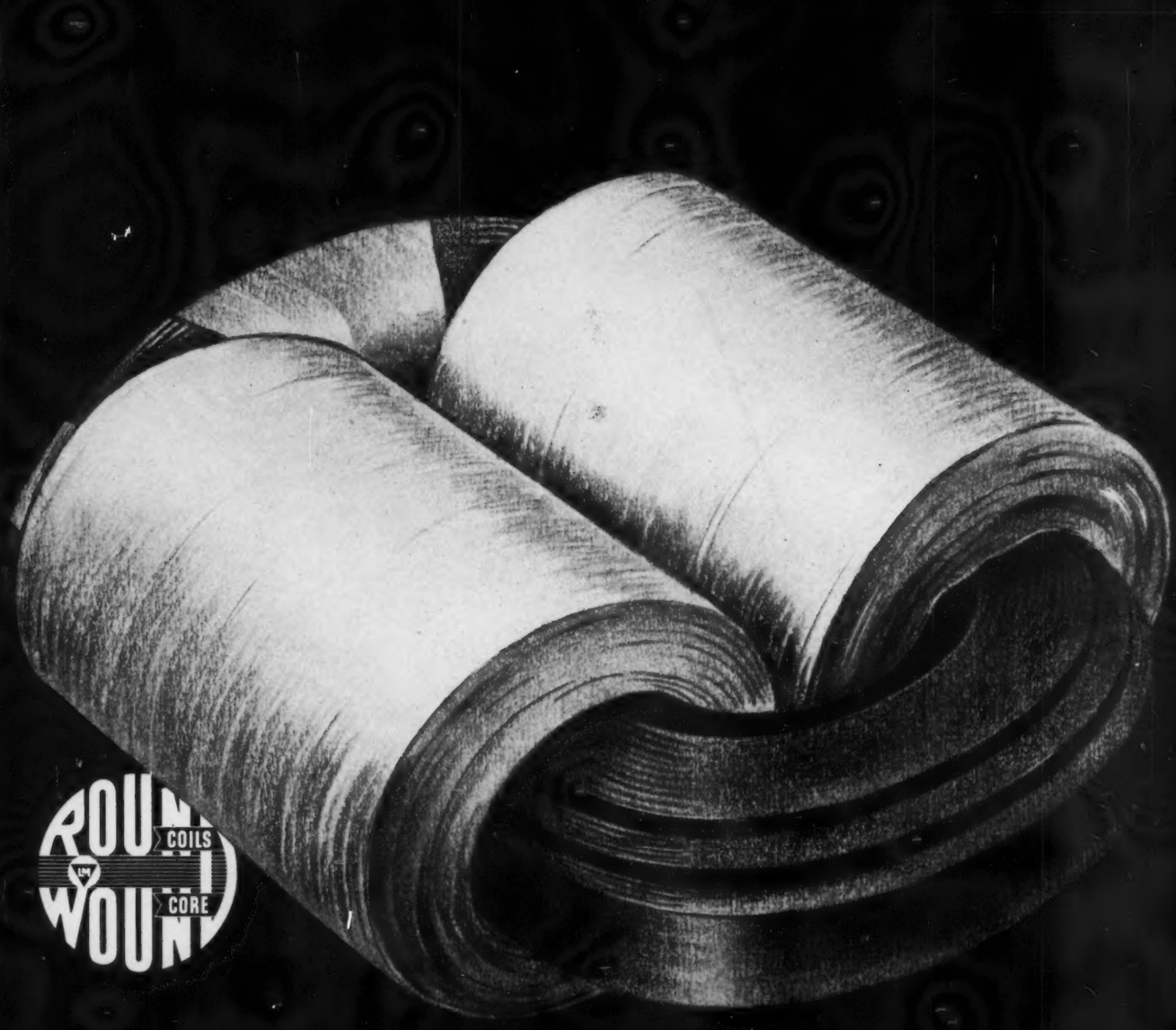
RMEL Show Tops

Rocky Mountain Electrical League, seasoned in showmanship and financed by private utility memberships, was called upon, last month, to help stage promotional demonstrations at Colorado Springs and Fort Collins, Colo., and in Raton, New Mexico, where the communities are served by municipal systems. George E. Lewis, RMEL manager, a ne-plus-ultra sportsman, responded enthusiastically by contributing Black Lighting equipment and costumes to Fort Collins and Colorado Springs exhibits, and furnishing the "voice of experience" (mellowed by many promotional enterprises) for Raton. Later, the RMEL is pledged to assist Raton when it celebrates completion of a modern street lighting system.

Adding color to the pleasant relationships was the life-and-death municipal ownership struggle in two Colorado communities which was in progress at the time. Brighton, near Denver, rejected the public ownership idea emphatically and proponents took their defeat philosophically. At Montrose, however, adherents took exception to the election returns and filed suit, alleging non-taxpayers had voted. But the court held there was not sufficient evidence to sustain the charge. Montrose has balloted on the issue four times.

● INDUSTRIAL electric trucks were the subject for discussion and exposition at the April 15 meeting of the Electrical Maintenance Engineers' Assn. of Southern California, Los Angeles. W. E. Ryder, Edison Storage Battery Co., spoke on "Electric Trucks, their Application in Industry" and showed a moving picture of the manufacture of batteries and their use in portable industrial trucks.

April also found the Maintenance Engineers holding their annual stag and frolic at Sunset Field Golf Club April 25. A big program was arranged by Jerry W. Ellis, social committee chairman.



The L-M ROUND-WOUND is the only Transformer with long, round coils on a wound, cruciform core.

As a result, L-M ROUND-WOUND Transformers have better regulation at all power factors, better ratio of losses, lower exciting current, uniformly high impulse strength, high short time overload capacity.

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LINE MATERIAL COMPANY

NEWS of the industry

BONNEVILLE

Having oversold its existing firm capacity, Bonneville Power Administration faces a possible temporary power shortage in June and July that will be met by purchase of 20,000 to 25,000 kw. from Seattle City Light. The shortage is due to defense power requirements of Alcoa and Reynolds Metals Co. for aluminum manufacture. Alcoa's fourth reduction unit will be ready June 1 and the Reynolds' plans call for operation June 15. Total requirements of both companies will be 222,250 kw., although this demand will not occur until early in 1941.

Meanwhile the U. S. Army Engineers are rushing work on unit No. 5 at Bonneville and plans call for its operation by August 1. Also unit No. 1, rated at 108,000 kw., will be ready for operation at Grand Coulee at about that time.

Bonneville has executed an open contract for power with the Clark County (Wash.) PUD following the failure of that body to renew its fiscal contract with Guy C. Myers, who is acting for several Northwest PUD's. The Clark County PUD has also requested Dr. Paul J. Raver, Bonneville administrator, to serve as negotiator in purchase proceedings with both Northwestern Electric and Portland General Electric companies, the two utilities serving the county.

Recent negotiations by Dr. Raver for purchase of facilities of the Eastern Oregon Light & Power Co. in Baker and Union counties, Ore., have reached an impasse. LeRoy Grettum, vice-president and general manager of the company, has announced that the proposed purchase price is far below the value of the property.

Two public ownership organizations in Spokane have passed resolutions requesting that the Bonneville administration undertake negotiations to purchase the facilities of the Washington Water Power Co.

HETCH HETCHY

San Francisco's Hetch Hetchy power difficulties appeared still far from settlement late last month when Secretary of Interior Ickes notified Mayor Angelo Rossi that the proposed leasing arrangement for the Pacific Gas and Electric Co. distribution facilities failed to comply with the Ickes' interpretation of the Raker Act. Without revealing what his final action would be, Secretary Ickes stated that he would call public hearings on the leasing deal at a time and place to be announced later.

The lease has been in Washington since March 12, the deadline date set by the Secretary in his negotiations with city officials. Since then it has been studied by engineers and attorneys for the Interior Department and the FPC. Meanwhile the city's plan of actively taking over electric distribution has been postponed from July 1 to October 1, assuming that the lease ultimately will be approved.

INDEPENDENT MARKET AUTHORITY URGED

The Northwest Public Power Association, formed by 17 municipal power and light systems and public utility districts operating in Washington and Oregon, have sent to congressional delegations of the two states a proposal for an independent Columbia authority to market Grand Coulee and Bonneville power. The agency would be similar to the Tennessee Valley Authority, but would be outside the control of Secretary of Interior Harold Ickes.

B. R. Lean, superintendent of the Cheney, Washington municipal plant, and president of the association, stated that "the association recognizes that whatever agency operates the Grand Coulee and Bonneville projects will in a large measure control the power and economic development of the Pacific Northwest."

He added: "The question herein involved is whether that control should vest in the Secretary of the Interior or in an independent regional authority with local directors on its board. The Northwest Public Power Association believes in regional rather than authoritarian administration of Bonneville-Grand Coulee power, and hence favors creation of a Columbia power authority. The association believes that concentration of this control in the interior department, or any other bureau or department, would be a most dangerous concentration of authority tending to make puppets of administrative officials and a province of the Northwest."

According to the associations plan, three members of the proposed authority would be appointed by the president of the United States, one would be named at large and two from a panel chosen by public bodies having contracts for the purchase or interchange of power from the Columbia river dams.

CENTRAL VALLEY FUNDS ASKED BY FDR

President Roosevelt has asked Congress for funds for an immediate start on construction of a 150,000 kw. steam generating plant for the Central Valley, California, public power-irrigation project. A total increase of $13,750,000 over original budget funds for Central Valley for the fiscal year beginning July 1 is recommended, of which $4,000,000 is to start the steam unit.

Other portions of the additional appropriation request are designed to speed construction work at Shasta Dam with the idea of bringing in this project a year sooner, to start work on the Friant-Kern canal and the Keswick power dam. Stepping up of Central Valley work is part of the New Deal's "all-out" program to push public power projects in the name of national defense.

Recommendation for starting the Central Valley steam plant comes as the Government's indirect rejection of the Pacific Gas & Electric Co.'s proposal to tie up the federal hydro development there with the utility's steam generation to make unnecessary expenditure of millions of dollars of tax money for duplicating operations.

● MERCURY VAPOR LAMPS for principal thoroughfares of Denver, Colorado, already in use for downtown streets, are being urged by Geo. E. Cranmer, manager of improvements and parks. Present installations of vapor lamps are too costly to maintain generally, according to Cranmer, and the bureau is requesting Public Service Co. of Colo. to reduce rates so that substitution of mercury vapor lamps can be made within the city's budget of $285,000 for 1941 street lighting.

● NEW STATION EQUIPMENT is being installed at Pacific Power & Light Co.'s Cove (Ore.) plant to put Madras, Ore., on a direct line with the Crooked river hydroelectric development, according to W. A. Lackaff, district manager. The new power transmission for Madras is one of a series of projects to produce additional generating capacity on Crooked river. Changes in PP&L generating facilities and transmission system follow terms of a contract between the company, the U.S. Bureau of Reclamation, and the Jefferson county water conservancy district.

TEST-TUBE BABY... it brings cable mortality rates 'way down!

IT'S NOT a very handsome baby as babies go. But, in action, you'll recognize a great basic improvement in impregnated paper power cable. It is Anaconda's new construction known as Type CB*.

It was born in the Anaconda laboratories, when an engineer applied the principle of conditioning oil by the introduction of carbon black, in a series of experiments then being carried on.

This principle when applied to paper-insulated oil-impregnated cable more than trebled the life of the cable, under accelerated aging tests.

And therein lies a story:

It is the story of Anaconda research... research that has produced scores of test-tube babies whose method of creation has been a boon to wire and cable users. In addition to Type CB, there is Sunex Securityflex*, the cable that operates as efficiently 10,000 ft. high in the mountains as 3,000 ft. below the earth's surface.

There are a host of other Anaconda products with special properties for standard and special wire and cable requirements . . . one or many of which may suit your particular conditions. Put them to work for you! *Reg. U. S. Pat. Off.

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This familiar trademark identifies Anaconda products. It symbolizes the best efforts of man and science

USE MODERN IMPROVED
ANACONDA WIRE AND CABLE

"We saved a lot of time an' trouble an' concrete"

DRILL HOLE

DROP ANCHOR

EXPAND

Chance ROCK ANCHORS require no grouting

There is no need for carrying concrete and mixing materials or lead and heating equipment on the job when anchor installations must be made in solid rock.

With this modern method the only equipment necessary is a rock drill. To install the anchor simply drill a hole by hand or power, drop the anchor into the hole and expand it by turning the rod. The large tripleye admits a bar for use as a wrench. The expanding action wedges the anchor into the hole and the pull on the rod increases the force of this wedge. The Chance Rock Anchor method is definitely a big time, labor and money saver. Installation costs are about 35% less than the old method.

Ask the Chance man or your jobber's salesman for information or a demonstration.

A·B·CHANCE CO. CENTRALIA MISSOURI

PG and E SEEMS TO BE FAIRLY BUSY

Revision of its long range power development program so as to provide additional early capacity for national defense has been announced by Pacific Gas and Electric Company. Construction will be undertaken immediately on a 13,500-hp. hydroelectric plant on the Yuba River in Sierra county, Calif., and a second 40,000-kw. turbo-generator will be installed in the Oleum steam plant now under construction on San Francisco Bay.

The Oleum plant is one of three duplicate stations being built adjacent to oil refineries for the purpose of supplying power and steam to the refineries in exchange for refinery wastes to be used as fuel. The Avon plant is ready for operation. The stations at Martinez and Oleum are under construction. Initially each installation was to consist of a tandem compound 1,500-lb., 950-deg., 40,000-kw. turbo-generator. Oleum will now contain two such units.

The Upper Narrows hydro plant will be built in conjunction with a hydraulic mining debris dam which has recently been completed. Power rights, which were held by Frank Bonner, former FPC chief engineer, have been obtained by the company. The plant will contain a single vertical water wheel rated at 13,500-hp. driving an 11,000-kw. generator.

Defense Housing Wiring Adequacy Questioned

Defense housing is being wired with such a minimum of adequacy that concern is felt as to its effect on the future of the communities in which such housing is built. Although the standard of construction otherwise is rather high, with proper plumbing, insulation, and weather stripping, wiring is of the barest minimum.

Usual standard, as found at several locations, consists of two No. 10 wires for service; two circuits, one for lights and one outlets; an 11½x18-ft. living room with only two convenience outlets, no ceiling fixture or switch; three bedrooms each with one wall bracket near the doorway on a pull chain, and one convenience outlet; kitchen, one ceiling light with pull chain drop cord and one convenience outlet for refrigerator; bath with the only switch in the house for a single bracket above the mirror.

Such standards are far below those of FHA requirements. In contrast to a recent NYA project where 35-ft. candles of indirect illumination is provided they seem ridiculously out of line. Since many of these projects are of permanent construction and will be used for low-cost housing in the future, such standards of wiring in the concrete walls and floors definitely limits the capacity to use electricity in the future.

● Sierra Pacific Power Co. has completed a street lighting extension program in Reno, Nev. The installation required three months to complete, and encompassed main Reno thoroughfares.

● The 1941 Law granting PUD commissioners $10 a day expenses while actually working will benefit none of the commissioners now in office, Attorney General Smith Troy, at Olympia, Wash., has ruled. He advised State Auditor Cliff Yelle, that the salary of any public official could not be increased or decreased during his present term of office. If he is reelected for another term, Troy ruled, the increase then can be granted.

● Voters of Montrose, Colo., on March 25, voted thumbs down to the proposal that a municipal power plant be set up and by doing so approved a new 10-year franchise for the Western Colorado Power Co. to supply electric power.

This was the city's fourth special election ballot in two years on the issue of municipal vs. private utility operation. A 20-year franchise of the Western Colorado Power Co., at Utah Power & Light Co. subsidiary, expired in 1939.

In April 1939, a proposal to establish municipal ownership of a power plant and distribution lines was rejected. Five months later, a new franchise was denied the utility. In November, 1939, three members of the city council who had opposed the company franchise were defeated for re-election and another proposal for municipal ownership was defeated by a decisive margin.

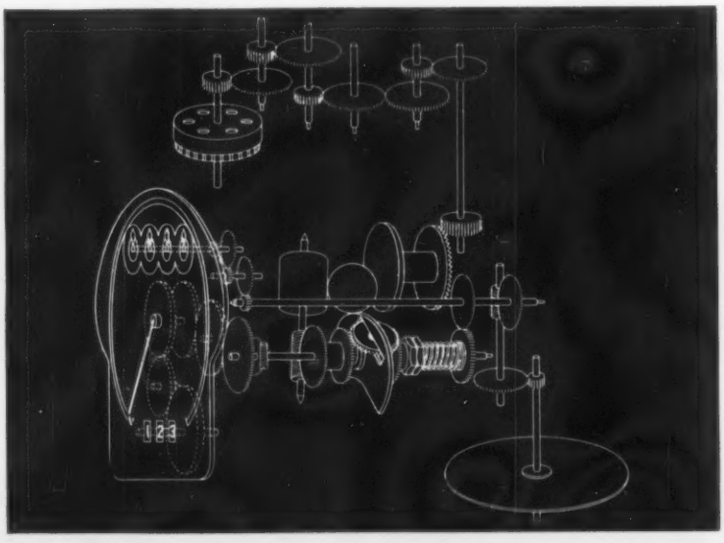
The old question about "how fast is fast service" has been answered by liveline foreman J. C. Alexander of Corcoran, Calif. district of Pacific Gas and Electric Co.—he flew. A dredge operating on Tulare lake was too close to a 12,000 volt power line, and it was necessary to de-energize the line. Road transportation, due to flood conditions, was impossible and boat transportation was too slow, so the operator of the dredge took Alexander in his plane and flew him to the mid-lake landing field on Pelican island, from which Alexander set off for his duties.

RL registers

(LOGARITHMIC)

Type RL Registers, indicate demand on a 300 degree dial.

The Type RL-2 Register has a cyclometer type cumulative demand dial.



FOR HIGH-ACCURACY . . . LOW-MAINTENANCE . . . KW DEMAND METERING

COMBINES WATTHOUR AND LOGARITHMIC DEMAND registers in a single unit. RL registers operate on the logarithmic principle like the thermal demand meters but their accuracy corresponds to that of the watthour meter.

Because of its mechanical simplicity it provides a better approach to the long life and low maintenance of the thermal demand meter.

NO CLUTCH IS USED—and no periodic resetting of the mechanism to zero at the end of each time interval. This eliminates one of the principal sources of maintenance in mechanical demand registers—the clutch.

MOTOR IS A TIMING DEVICE only—operating without load, another protection against wear, maintenance and failure.

Any Westinghouse single-phase or polyphase watthour meter (type OA and later) can be equipped with this register.

CHECKING IS EASY because the register can be manually reset to zero at any time and verified for accuracy of registration and time of demand interval.

The Westinghouse line of demand meters is complete—for small, medium, and heavy loads. A Westinghouse meter man can help you in applying the right equipment for modern demand metering on your lines. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., Dept. 7-N.

The RL register operates on the principle of balancing motions. The meter tends to drive the demand pointer up scale through one side of a differential. The timing device tends to offset this motion of the demand pointer by driving the other side of the differential in the opposite direction at a rate also proportional to the load. This variable speed drive from the timing motor is made possible by a cam controlled by the load.

J-40301

Westinghouse Meters

Insulation Tips

FOR RADIO NOISE-MINDED ELECTRICAL ENGINEERS

★

R.I.P. Glaze Eliminates Insulator-Generated Noise

Westinghouse R.I.P. (Radio-Interference-Proof) treatment is a semi-conducting metallic oxide glaze applied to the insulator surface which becomes an integral part of the insulator during the normal firing process.

This protective R.I.P. glaze is positive in its action under all operating conditions... permanent... inexpensive. R.I.P. will never wear off, has no extra parts to install or service.

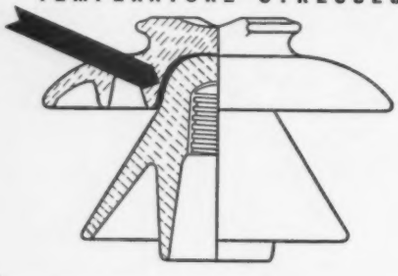
BEFORE R.I.P.

Capacity currents jump across the tiny air gaps that exist between conductors and insulator surfaces. These capacity arcs are miniature radio stations. Their signals are picked up at every point on the dial. Result—radio interference.

AFTER R.I.P.

Note what happens on an R.I.P. insulator. Capacity currents flow through contact points, but not across air gaps. No arcs . . . no radio interference.

RESILIENT MATERIAL ABSORBS TEMPERATURE STRESSES



NOT A HEAD HAS *"POPPED"* SINCE WORLD WAR 1!

Early pioneer pin type insulators *did* have a weakness of "popping off" their heads. But not since World War 1 have we heard of a single Westinghouse pin type insulator being guilty of such an act.

A resilient inner lining absorbs and equalizes all temperature and load stresses—guarantees that Westinghouse pin types will keep their heads under all normal operating conditions.

Use R.I.P. Pin Type Insulators

FOR LOW-COST, NOISELESS TRANSMISSION LINES Up to 66 KV.

R.I.P. pin type insulators offer transmission line engineers two ways to save money . . . *plus* freedom from insulator-generated radio interference!

On new lines, pin types do not require the greater pole heights necessary with suspension insulators. On single circuit lines only one crossarm is needed. Third phase goes on pole top pin. This reduces pole . . . hardware . . . labor costs. *To increase voltages on existing lines*, just replace present insulators with the new pin types. No new poles are necessary, and usually, no new crossarms. The required additional ground clearance is inherent.

R.I.P. treatment eliminates radio noise formerly synonymous with pin type construction and enables you to profit by lower construction costs and rapidity of change-over. Why not investigate? Two complete and modern Westinghouse porcelain factories —at Derry, Pa., and Emeryville, Calif. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., Dept. 7-N.

HERE'S HOW R.I.P. PIN TYPES RAISE LINE VOLTAGES ECONOMICALLY

Yesterday

When the engineers of a utility faced the problem of raising the voltage of a line, built originally under closely designed clearances, from 33 kv to 66 kv, it was a difficult one. No R.I.P. insulators were available. Therefore the line had to be rebuilt . . . new suspension insulators, new crossarms and very likely new poles were involved.

Today

Through the use of Westinghouse R.I.P. high voltage pin type insulators, utility engineers are able to salvage the complete line. The old suspension insulators are removed for use elsewhere and they are replaced with new R.I.P. pin types. The solution is economical and simple. The new Westinghouse R.I.P. pin types are noiseless.

J-05122

Westinghouse Porcelain

ATTENTION LIGHTING SALESMEN!

HOW MANY OF YOUR CUSTOMERS WOULD FLUNK THIS *Lighting Quiz?*

1 THE LIGHT IN SHADE IN SUMMER IS HOW MUCH STRONGER THAN THE AVERAGE LIGHT IN HOMES AT NIGHT?

ABOUT 5 TIMES ☐ *25 TIMES* ☐ *100 TIMES* ☐

2 HOW MANY GRADE SCHOOL CHILDREN HAVE DEFECTIVE EYESIGHT?

1 IN 5 ☐ *1 IN 25* ☐ *1 IN 50* ☐

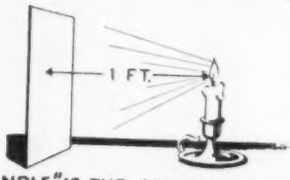
3 DARNING STOCKINGS MAY BE DIFFICULT BUT IT'S EASIER THAN READING A BOOK

TRUE ☐ *FALSE* ☐

4 AS EYES GROW OLDER THE PUPILS CONTRACT REQUIRING

MORE LIGHT ☐ *LESS LIGHT* ☐

5



A "FOOTCANDLE" IS THE AMOUNT OF LIGHT THROWN BY A CANDLE A FOOT AWAY . . .

HOW MANY FOOT CANDLES HAVE YOU IN YOUR LIVING ROOM? HOW MANY SHOULD YOU HAVE?

ANSWERS TO LIGHTING QUIZ:

1 Frequently 100 times stronger. **2** One out of five grade school children. Two out of five at college age. **3** FALSE. Several times as much light is required for darning socks. **4** More light required. As eyes grow older, the pupils become smaller and *more* light is necessary for seeing. **5** You should have at least 20 to 30 footcandles of light in your living room at every easy chair or davenport, used for reading.

EIGHT years ago this summer, the Better Light-Better Sight Program was started. Despite all the progress made to date, there is still a lot of educational work to be done. With fifty footcandles looming up as practical levels in commerce and industry—being installed by more progressive business men—a lot of education remains to be done if the average business is going to use this new fluorescent lighting, for example, to produce more profitable sales rather than a mere reduction in operating expenses.

THE PROPER LEVELS OF LIGHT can be sold—are being sold—where the salesman particularly understands the customer benefits of adequate lighting, (as dramatized in the quiz above), and where the salesman is backed up by advertising and demonstration directed to the customer.

1941 must be a year of *education*—as well as *sales*. When you show the man who runs a factory, office, or store what a powerful new force modern lighting is—when you prove that the additional expense of a 50-footcandle installation can come back many times over in reduced errors, increased sales or production, faster work, and improved morale—you've gone a long way toward making a sale!

JOIN THE FORTY-NINERS CLUB! Membership in the 49-ers Club is extended to any salesman primarily responsible for selling an installation of 49 footcandles or more, or to any executive who works under 49 maintained footcandles. For full details, write Secretary, Forty-Niners Club, General Electric Company, Nela Park, Cleveland, Ohio. Or consult your G-E Lamp Division!

G-E MAZDA LAMPS

GENERAL ELECTRIC

Western Market Indices

Northern California, an intensive but fairly representative area, records a 24% increase in home construction, first quarter '41 over same period '40. Frame residential construction continues to increase in volume, with consequent greater demand for staple wiring material.

Employment, Building Permits

California employment for the first quarter of '41 increased 35% in personnel and 55% in payroll over the first quarter of '40. Value of building permits in seven Western states during March, '41, increased 44% over '40. though recording a slight decrease below February, all in Washington. Six California cities, besides Seattle, Portland and Boise, Idaho, exceeded the million mark in March.

Defense Construction

Recent housing awards cover $3,157,680 for Army barracks and dwellings at Anchorage, Alaska; $817,000 for Seattle; $959,789 for Sacramento, Calif., $760,000 for Alameda, Calif. Recent government defense work includes $909,200 for army flying field at Shafter, Calif.; $2,500,00 each for Ft. Ord, Calif., and Salt Lake City; $5,000,000 for Oakland, Calif. quartermaster depot. Proposed embarkation facilities in So. Calif. will cost $10,000,000 plus $2,000,000 for auxiliary quartermaster depot. $2,500,000 for Maritime Acadamy, Vallejo, Calif.; approximately $1,000,000 each for Pendleton, Ore., airport; Orange County, Calif. Naval reserve airbase; Humboldt bay sectional base; and Phoenix, Ariz. Electrical portions of such jobs may be gauged by the $2,500,000 ammunition depot near San Diego; includes $41,000 for electrical transmission, distribution, fire alarm and telephone systems plus wiring costs of separate barracks and buildings.

Shipyard Contracts, Const.

Six-way $5,000,000 shipyard authorized for Richmond (Calif.) in S. F. Bay region, to handle $40,000,000 construction of C3 cargo carriers. Five tankers at $2,000,000 each have been awarded a Tacoma, Wash., yard. Huge shipping contracts cover thirty one cargo carriers costing $46,500,000 for San Pedro, *a similar contract* for Portland, Ore., and a $14,500,000 aggregate for minesweepers and auxiliary tugs scattered among smaller Calif. yards.

Varied Orders

Four 1,500-kva. Pyronol transformers, $52,000, for Bethlehem Steel, S. F.; $23,000 of 200-hp. motors for a Nevada copper mine; $40,000 fractional hp. motors for calculating machines; nineteen 200-hp. motors value $55,000 for a Utah mine; $70,000 switch gear equipment for Pearl Harbor installation. Carrier current installations are being made for sectors of PG&E's and the Bonneville systems; also for Elephant Butte and Parker, Ariz., projects. Bonneville purchasing includes $48,000 115 and 196-kv. insulators; $17,500 wood poles; four 4,000-kva. Allis-Chalmers transformers value $40,902; and $40,614 copper wire for its Longview sector. Shasta Dam is buying $100,000 thin wall tubing and $120,000 1-in. black pipe. Reclamation Bureau is requesting $41,000,000 for Bullshead dam and plant to assist in Boulder storage and regulation, with $5,000,000 as an initial appropriation. $25,700 Bethlehem 230-kv. tower assemblies for Grand Coulee; $20,177 Westinghouse cabinets and cubicles for Shasta Dam; $65,146 for Worthington diesel-electric generator for Wendover, Utah, bombing range; fourteen 500-hp. synchronous General Electric motors costing $65,000 for a Utah copper mine; 800 fractional hp. motors for pressure pump systems.

The American washing machine, prosaic though it may appear to the U. S. housewife, is doing full war-time duty in Holland—cleaning clothes, and churning butter! Out in the farm areas, where churns are sealed in accordance with rationing regulations for German-occupied Netherlands, it has been discovered that the American type of machine, fitted with a revolving clothes agitator, is especially suitable for illicit churning.

Night Ball For Class "C" Parks

Ball parks of the new Class C "California League" at Stockton, Fresno, Bakersfield, Riverside and Santa Barbara will be lighted for the first time this year. Using a new high efficiency sportslight developed by General Electric, the system to be installed will increase general levels of lighting in "Texas League" areas where formerly many errors were made because of shadows on the outfield side of the ball.

Intensities will vary from a minimum standard of 25 ft.-candles average on the infield to the approximately 50 ft.-candles which will be obtained at the Santa Barbara park.

Poles holding the floodlights will be 80 ft. or higher at the five parks, to preclude eye discomfort for fans. This coupled with better lighting for parking facilities should encourage attendance of women fans, who in the past have complained of smarting eyes, dark parking lots and, generally, that they "couldn't see the ball."

Engineers of the Pacific Gas and Electric Co., Southern California Edison Co. and the Nevada-California Electric Co. co-operated with General Electric engineers in planning the power facilities. Looking to the future, the California League parks will install adequate copper capacity so that more lights may be added.

Other city ball parks in the state to be lighted this year are Marysville, San Jose and Anaheim. San Bernardino, Merced, Roseville and Reno, Nevada, were lighted for the first time last year.

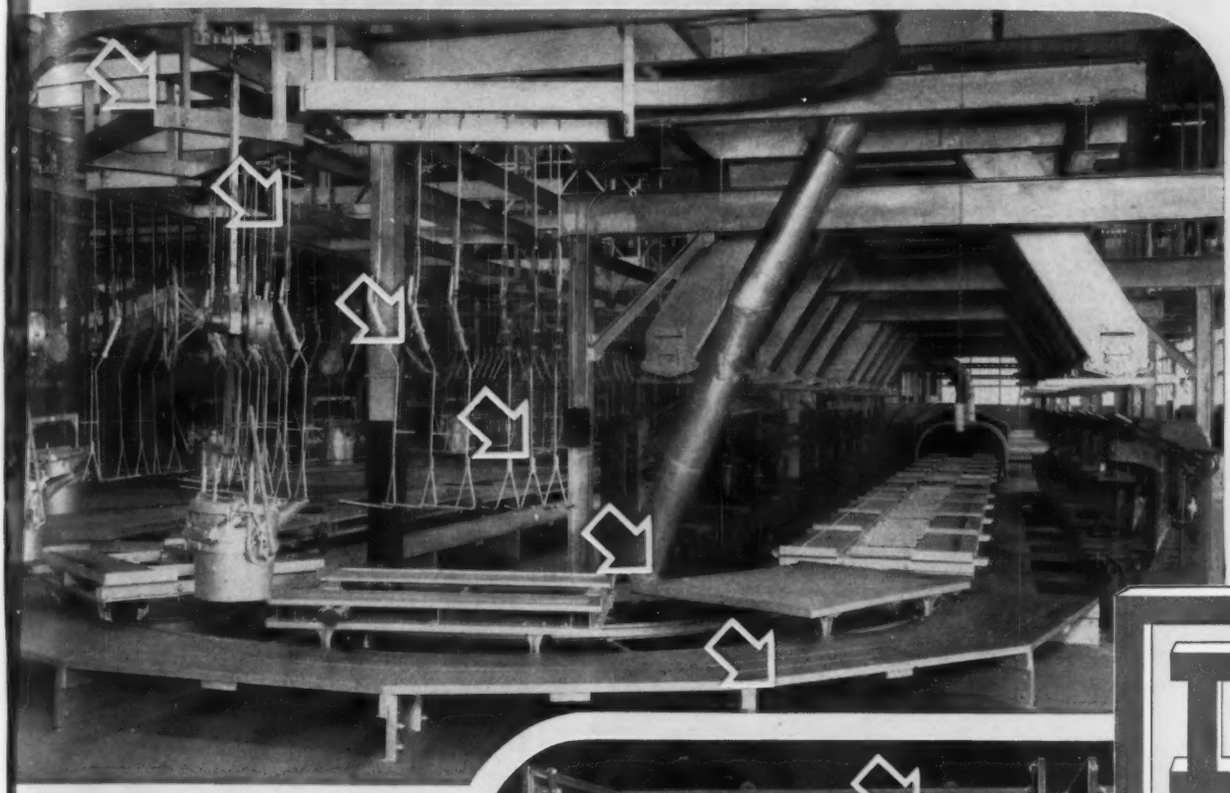
B.C. Cable Job Proves Difficult

With the aid of tandem hitched motor trucks line gangs of the B.C. Electric Railway Co. at Vancouver, B.C., have just completed one of the most difficult jobs of submarine cable-laying they have ever tackled. They laid 1550 feet of wire armored three inch cable across the North Arm of the Fraser River from the old Wells Air Harbor on Lulu Island to the No. 13 airport road on Sea Island. The extension will provide 12,000 volt electric service to the new Boeing Aircraft plant at the municipal airport.

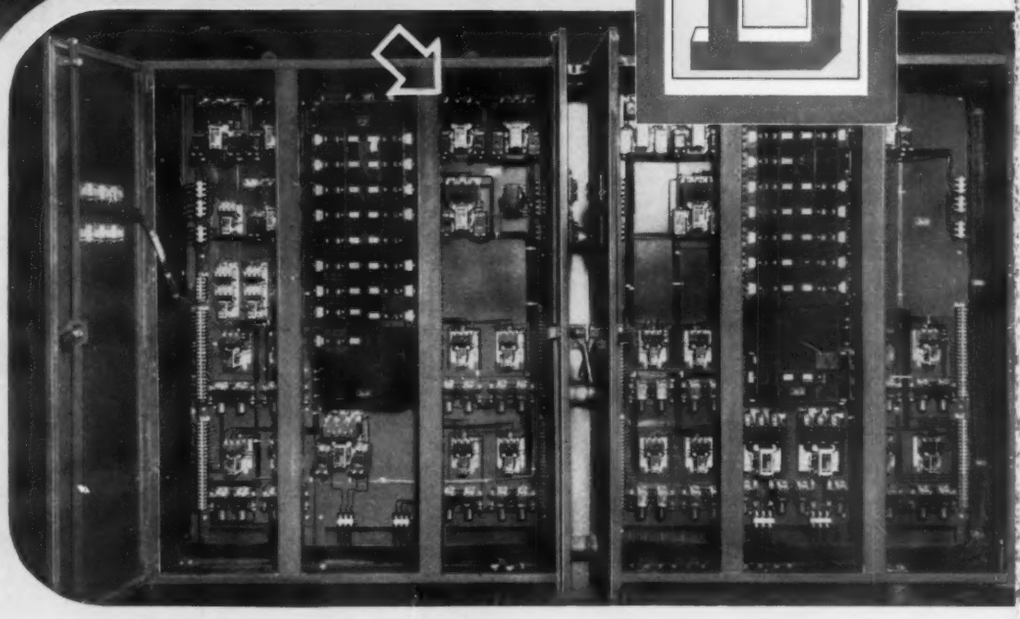
A three quarter inch steel high line cable was first strung high over the water, after which the submarine cable, weighing over eight and one half tons, supported by pulley blocks every 40 feet was pulled across. Two trucks, hitched in tandem, provided the motive power to pull the cable, which weighed the supporting highline cable down deep into the water. An hour later sufficient slack had been pulled in across the river and the supporting slings were cut and the submarine cable allowed to slip to the bottom. The new line extension represents an investment of $3500.

● Rates Raised—On April 1 the municipal power plant at Ephraim, Utah hiked its power rates 10 per cent and in some instances nearly doubled the cost of power as a result of action taken by the city council. The problem of adjusting the rates has been under consideration for a long time as an alternative to an extra tax on property. A new electrical ordinance will make property owners responsible for power used on their premises in the event renters or lessees fail in their accounts to the city

THIS FOUNDRY EQUIPPED WITH SQUARE D MOTOR CONTROL...



Above: **One of the six mechanized continuous conveyor units in the foundry of the International Harvester Company's new truck engine factory in Indianapolis.**



At Right: **The control panels are built from standard units with provision for future additions and also include circuit breaker distribution panels for motor disconnect and short circuit protection. The enclosing cabinets have vault door construction with roller operation to insure a dust-tight seal.**

● **When a foundry is completely mechanized for the production of 300 tons of castings a day, there must be no failure of the electric control system. Shutdowns would be very costly.**

Square D built the control panels and helped in the engineering of the intricate control system which plays such a major part in this highly mechanized operation. It is doing its important job — efficiently and consistently.

The Square D line of automatic motor control is complete for all industrial requirements. Square D engineering counsel and service is always available.

●

CALL IN A SQUARE D MAN

SQUARE D COMPANY

LOS ANGELES - MILWAUKEE - DETROIT

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

REDUCE THE MOST COMMON CAUSES OF LUBRICATION FAILURE

The *right* kind of lubrication means fewer breakdowns, lower maintenance. But improper lubrication means *trouble, costly breakdowns* and increased maintenance. Yet you *can* get long, trouble-free service. Here's how.

Unacal Turbine Oils can save you time, trouble and money. They were developed expressly to reduce emulsification, oxidation, sludge and foaming. They are carefully blended and refined to give you protection against breakdowns and reduce maintenance to a minimum.

Unacal Turbine Oils are available in any four grades to suit your turbine, whether steam or water-operated, direct connected or geared. Extra heavy grades are available for high speed, heavy duty Herringbone and Helical Reduction Gears and Kingsbury Thrust Bearings.

Your nearest Union Oil representative will be glad to give you additional information. Why not call him today?

UNION OIL COMPANY

Remington Plant Power Contract

Power for electric service to the Remington small arms ammunition plant, immediately west of Denver, will be furnished by Public Service Co. of Colorado under terms of a contract negotiated by E. M. Rowan, Wilmington, Delaware, Du Pont de Nemours executive, (loaned for the occasion) with the utility officials.

The job will involve expenditure of approximately $130,000.00, according to preliminary estimates. Cost to Public Service Co. will be around $30,000.00 for one-half mile of transmission wire connecting the company's 110,000-volt line with the northern boundary of the military reservation where substations will reduce voltage to plant requirements. Cost to the government for transformers, distribution system, circuit breakers, lightning arresters, etc. will be more than $100,000.00 All installations inside the reservation are to be made by Remington employes.

Although complete electrical requirements at the plant are not now known, available information describes two substations, each equipped with three, 1667-kva. transformers which will reduce voltage to 13,800. The distribution system will service some 3,000 motors, an elaborate refrigeration plant, water pumping station (3,000,000 gallons daily), fire protection and lighting equipment, operating at voltages varying from 110 to 440, beyond transformers within the reservation.

The anticipated connected load will be about 9,500 kw., and usage is estimated at approximately 3½ million kwh. per month.

Output of the Remington plant—to cost $26,033,109.00—will be 4,000,000 to 5,000,000 thirty caliber cartridges daily. The government contracts to purchase $82,109,080 worth of the small arms ordnance the first year of operation.

● A PROGRAM of expansion for City Light, Seattle, Wash., designed to modernize the utility's lines and substations throughout the city, and costing $884,010, has been approved by the City Council. The council was advised by Lighting Superintendent E. R. Hoffman that he believed City Light's increasing business and revenues will pay for the extension program, and there will be no necessity for a bond issue. Demand in 1940 in downtown Seattle showed an increase of 2.74%.

Most of the money will go for substation increases, while $40,000 will be spent on street lighting.

YOU ASKED FOR IT!

THE PROMOTION THAT WILL REALLY MOVE YOUR LONG-PROFIT ITEMS!

AND HERE IT IS—

GE "Honeymoon Special"

Three Most Popular Electrical Gift Items Fitted Into A Gorgeous

WHEARY TROUSSEAU CASE

All For Only

$29.95

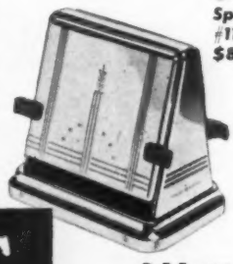
And Here's How We're Telling All America About This Big Special!

Most Compelling Appliance Ads You've Ever Seen—*Keyed To Your Profits*—Are To Run In Big Space In "Ladies' Home Journal" and time after time in "Life Magazine"

Now—seize your opportunity to reap easy, quick profits from one of the greatest promotions ever put behind electrical appliances during the May–June Gift Season. Three of the most popular gift items in America are now fitted into a handsome Wheary Case that simply shouts "Here is *the* gift you've been looking for." New, startling, it's a sure stopper when put in your window. And it's a "closer" also. For the purchaser gets this complete ensemble for only $29.95. For multiple sales of long-profit items, *there's never been anything like it!* Dealer cost on the complete package of three appliances in the Wheary Trousseau Case is only $19.39. There's a profit to the Dealer of $10.56 per ensemble sold. Reserve your "Honeymoon Specials" from your distributor today.

G-E Automatic Glass Coffee Maker Cat. #129P8—Price, $12.95

G-E Automatic Speed-Iron Cat. #119F113—Price, $8.95



G-E Expan-Dor Toaster Cat. #119T48 — Price, $4.50

GENERAL GE ELECTRIC

The MOST COMPLETE LINE OF Service Connectors

LARGEST VARIETY of types, and a COMPLETE range of sizes. For all kinds of conductors.

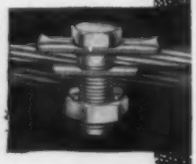
Popular connector at left is carried in stock in ALL sizes, up to 1,000,000 CM. Furnished with or without retainer.

ANY MATERIAL — Hardware Bronze, Silicon Bronze, Aluminum.

MILLIONS IN USE and never one rejection due to performance or workmanship. Can be re-used over and over.

MADE IN OUR OWN PLANT under engineering supervision. Bodies and nuts precision machine-threaded for perfect fit. No sharp edges.

ALUMINUM Connectors machined from hard drawn rod, with forged spacers.



SERVICE POST Connectors for one or more conductors; many types.

SERVICE ENTRANCE Connectors with extruded copper bodies, Everdur screws.

TELEPHONE Service Connectors, brass rod—plain, nickel plated or tinned.

And THOUSANDS more—write for Catalog.

NICHOLAS & COOK
1063 Howard Street, San Francisco

NORTHWESTERN AGENCIES
2411 First Ave., Seattle, Washington

KENNETH ANDERSON CO.
1855 Industrial Street, Los Angeles

Penn-Union Electric Corp., Erie, Pa.

PENN-UNION
Conductor Fittings

Utah Power Officials Supoenaed by FPC

Officials of the Utah Power & Light Co. were supoenaed to appear at a hearing of the FPC in Salt Lake City, May 5 "to produce original cost records of its acquired properties."

Geo. M. Gadsby, company president, said in a formal statement prior to the series of meetings that his company had already made available to the FPC all such books known to be in existence. "The company as we know it today is a composite of more than 100 predecessors, the oldest dating back in 1885."

"Most of the original predecessor companies and individuals subsequently sold their physical electrical properties. Books and records in these instances were retained by the seller and only occasionally were the records of the first owners acquired by the present operating company."

Puget Sound Personnel Changes

The Puget Sound Power & Light Co., operating in the Pacific Northwest, announces the following changes in personnel:

Frank Walsh, northern division manager of the company, has been transferred from Bellingham to become central division manager in Seattle. John Hickock will remain as manager of the Bellingham district. Walsh is a veteran of twenty-nine years of service with the company, beginning as an electrician's helper in 1912. Through his years of service, he has been manager of the Lynden, Wenatchee, Everett districts, assuming the northern division managership post in Bellingham in 1936.

Charles F. Terrell, Seattle, has been named to full-time duty as operating manager of the PSP&L, devoting his entire time to supervision and development of electrical generation, transmission and distribution facilities. Terrell joined the power company as a machinery wiper in Seattle in 1910. In 1923, he became northern division manager. Two years later, he left the company, going to Texas and Florida, where he was associated in executive capacity with several power and light companies. He returned to the PSP&L employ last November as both central division manager and operating manager.

C. F. Boring, former assistant superintendent of the Everett district, has been named by L. A. Williams, district manager, to the superintendency of the Everett district. He succeeds Harry Tecklenburg, resigned. Boring's connection with the company began 28 years ago, when he joined the installation crew. He has served as meter department foreman, superintendent of meters and service and assistant superintendent.

B. C. Ass'n Accounts For $18,839 Wiring

Electric wiring work, valued at $18,839, was transacted by members of the Electrical Assn. at Vancouver, B. C., during the 12 months ending March 31 for the B. C. Electric Railway Co. This is the highest figure which has yet been reached since the plan of co-operation between the electrical contractors and the central station was adopted as the result of negotiations carried out by the Electrical Service League of B. C.

The work is turned over to the association by the League on behalf of the B. C. Electric Railway Co. and the association distributes the work amongst its membership, taking into consideration principles of rotation and of geographical distribution by districts. The system has worked out to the complete satisfaction of the power company, the contractors, the Service League and the dealers handling the appliance sales which are installed under this method.

During the month of March a total of $1,849.35 worth of business was done under the same arrangement.

● PERFECTION of an electric eye which automatically and without favoritism, causes four fly sprays to drench each cow as she enters the milking stable has been announced by the agricultural engineering department of the University of Idaho. Professor Hobart Beresford is credited with this device, which has in its favor the elimination of time-taking hand spraying and which effects a material saving in spray.

Electrical terminology has some new words, thanks to an original and thoroughly non-technical secretary in the Puget Sound Power & Light Co. engineering department. According to George Quinan, chief engineer, the dictation of one engineer referred to "bare conductors and star connected transformers" in discussing service facilities for a new customer.

As transcribed by the secretary the description came back "bare conductors and stark naked transformers." In the department now when any reference is made to "star," the statement is immediately corrected with "Oh no, you mean naked!"

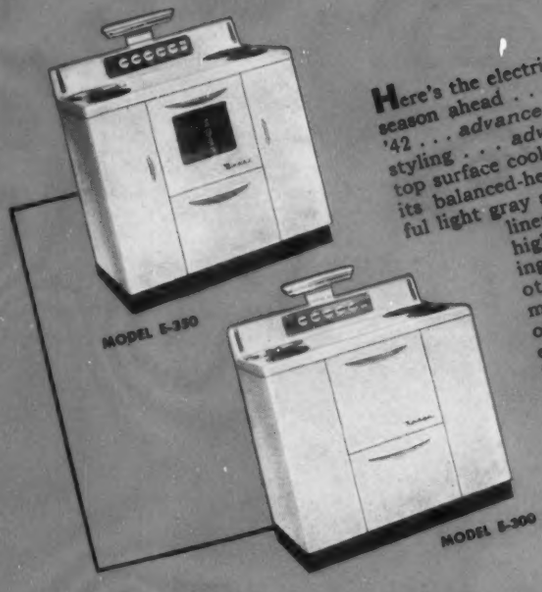
Ready FOR SELLING Now!

7

Sparkling NEW 1942

NORGE ELECTRIC RANGES

MODEL E-450



MODEL E-350

MODEL E-300

Here's the electric range that's a full season ahead . . . the new Norge for '42 . . . *advanced* in its gorgeous new styling . . . *advanced* in its 6-speed top surface cookery . . . *advanced* in its balanced-heat oven, with beautiful light gray speckled porcelain oven liner . . . *advanced* in its high-speed, waist-high broiling . . . *advanced* in all the other features that have made the name Norge one of the best known in the electric appliance field. Seven stunning models, with basic list prices starting at $99.95 . . . each with a profit margin that will make money for you *now*. See your Norge Distributor now or write, wire or 'phone for the complete details.

Sell THE RANGE THAT'S A *Season Ahead* NORGE!

NORGE ELECTRIC RANGES

NORGE DIVISION BORG-WARNER CORPORATION, DETROIT, MICHIGAN

ROLLATOR REFRIGERATION | COMMERCIAL REFRIGERATION | GAS RANGES | WASHERS | HOME HEATERS

A FAMILY OF PRODUCTS—FOR YEAR 'ROUND PROFITS

See NORGE BEFORE YOU BUY!

PEOPLE

made this news

GRAYBAR CHANGES

Graybar Electric Co. on April 1 announced these changes:

Vern A. Brown, with Graybar for 6 years, resigned as Merchandise manager of the Butte office to accept the position of manager of the Peffer Co. department store at Stockton, Calif.

O. W. Balser, salesman at Boise, was transferred to Fresno where he assumes the position of sales manager replacing H. S. Siesbuttel. Siesbuttel is now at Graybar's San Francisco office.

D. H. Capelli, Graybar, Salt Lake, now is merchandise manager of both Salt Lake and Butte territories.

L. M. Hansen, formerly claims clerk at Salt Lake is now salesman at Graybar's Boise outlet.

● F. E. Ross, refrigeration advertising manager of Westinghouse Merchandising Division, has been called to a year's active duty at Fort Benning Infantry School, where, as a captain in the reserve, he will serve as an instructor on the faculty of the infantry school. Ross has been given a year leave of absence and J. R. Clemens, who has been in charge of range and water heater advertising, will take over Ross' work. A native of Astoria, Ore., Ross attended the U. of Oregon, and later taught advertising at that school. He worked for a number of years for various Pacific Coast advertising agencies before becoming refrigeration advertising mgr. of Westinghouse in 1937.

● APPOINTMENT of Ladner V. Ross as manager of commercial sales in the general sales d partment of the Washington Water Power Co. was announced last month by R. B. McElroy, general sales manager. Ross succeeds the late M. R. Lund. Since entering the employ of WWP in 1926, Ross has served as illuminating engineer, and, in Nov. 1938, was selected by the State Progress Commission to design the lighting for the Washington buildings at the New York and San Francisco world fairs. Ross holds a bachelor's degree in engineering from Oregon State College and attended Chicago Art Institute.

Milton C. Sanders has been named assistant to the president of Central Arizona Light & Power Co., according to an announcement by Edward H. Coe, president. Sanders will have charge of publicity in addition to general supervisory work.

Sanders joined the AL&P in 1935, as advertising manager, and later in that year was made residential sales manager, which position he held until March, 1940, when he was appointed general sales manager. A. F. Morairty, assistant general manager, has been appointed vice-president in charge of sales and will take over direction of all sales and new business with J. T. Deppe as residential sales manager and C. T. Yates as commercial and industrial sales manager.

J-M PROMOTES BARKER

Appointment of G. A. Barker as manager of Johns-Manville's public utility and electrical products department was announced April 2 by L. R. Hoff, president of Johns-Manville Sales Corp. Barker, who has specialized in the development and sale of electrical commodities, was formerly staff manager of the electrical department for Johns-Manville.

An honor graduate of the University of California, College of Mechanics,

BARKER

Barker joined Johns-Manville in 1921 as Pacific division manager of the power products department at San Francisco. Prior to that he was associated with the Pacific Gas and Electric Co. in San Francisco, chief engineer for the Central Teresa Sugar Co., Cuba, and chief mechanical engineer of the Industrial Accident Commission of California. He is a member of Sigma Xi and Tau Beta Pi, honorary engineering fraternities.

● G. W. MILLIKEN, vice president in charge of sales, Southern Colorado Power Co., has been named regional director of Modern Kitchen Bureau for 1941 covering the states of Wyoming, Colorado and New Mexico. He succeeds Gaylord B. Buck, commercial manager, Public Service Co. of Colorado.

● JIM LITTLEFIELD, supervisor of the commercial service department of the Utah Power & Light company, was called to active army duty on Feb. 15. A major in the Army reserve, he has been succeeded at the utility by Maurice Dusenberry.

DEATHS

● GEORGE E. PETERSON, office manager of the Utah Power & Light Co., Salt Lake Division, died at his home in Salt Lake City, March 24. He had been in the employ of the utility for 30 years.

● WALTER T. LAWRENCE, prominent figure in Utah electrical circles for more than 34 years, died at his home in Salt Lake City, April 1, aged 54. At the time of his death he was intermountain sales representative for the Economy Fuse and Manufacturing Co., which position he had held for 18 years.

● KENNETH FRASER MOFFATT, 35, agricultural representative for the B. C. Electric Co. Ltd. at New Westminster, B. C., died suddenly last month. He was a graduate of the Faculty of Agriculture University of British Columbia. During his training he was engaged in soil survey work for the Department of Forestry throughout the province.

● WM. J. LYNCH, one of the oldest members in point of service of the D. E. Sanford Co., died April 4, at San Francisco, age 58. He had been manager of the glassware division but traveled throughout the West representing all of the appliance and other lines of the company for the past 30 years.

● GEORGE KATZ, proprietor of Merchanandise Clearinghouse, San Francisco, and a former electrical contractor and motor dealer, died April 18. Originally he ran a contracting business in Eureka, Calif., and then later was coproprietor of Peerless Electric Works in San Francisco until 1932. Since then he has operated a clearinghouse for obsolete and damaged wiring supplies and equipment.

● CHARLES NOACK, district manager, Pacific Gas and Electric Co., at Sonora, died March 31. A brother of Harry Noack of General Electric Supply Corp., Mr. Noack was a pioneer in this frontier western city.

● ERNEST CROWSON, proprietor of Crowson Agencies, San Francisco, died April 15 of heart attack. His career in the electrical industry began way back with the old California Electric Works which was later taken over by Western Electric Co. supply department. For many years he was the only road salesman covering western territory. He retired from Graybar Electric in 1932 and conducted Crowson Agencies as factory representative for table and major appliances.

NOW CORNING OFFERS 9" PYREX INSULATORS IN ALL 3 SUSPENSION TYPES

"LOOK at all three!", we say, and then figure your own savings! The new 9" Pyrex suspension gives *lowest first cost* for an equivalent amount of insulation, plus exclusive Pyrex insulator features. Weighs only 7½ lbs. packed, against the usual 12 lbs. Same leakage distance and wet and dry flashover characteristics as 10" units. Unusually high mechanical strength through glass tempering, improved cement and assembly technique! Write for specifications and test data today. Corning Glass Works, Insulation Division, Corning, N. Y.

SPECIFICATIONS FOR 9" UNIT:

Mechanical and electrical rating, pounds	15,000
Dry flashover, volts	81,000
Wet flashover, volts	49,000
Leakage distance, inches	11¼
Impact resistance, inch-pounds	75
Net weight, pounds	6⅓
Packed weight, each pound	7⅓
Standard package	6

The new 9" PYREX Unit has same striking distance as 10" Unit and moreover same leakage distance and same wet and dry flashover.

CORNING *means* Research in Glass

Pyrex Insulators
BRAND

LET'S PLUG IT IN ...Speedily!

Throwing the production capacity of this country into full swing—putting the country's mighty resources to work—PLUGGING IN the industrial machinery of the USA—that is today's big job.

It is a job that must be tackled with determination by every branch of the electrical industry.

To aid National Defense, Roebling has "plugged in" its facilities. Roebling plants are operating day and night—at full capacity.

Equally important, Roebling is unceasingly maintaining the high standard of quality for which Roebling electrical wires and cables are noted—a standard of quality that is a safeguard against shutdowns and delays, that assures all-around dependable service.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY

ROEBLING
ELECTRICAL
WIRES AND CABLES

LEMMON ELECTED SIERRA POWER HEAD

H. A. Lemmon, who has been manager of the Sierra Pacific Power Co., Reno, since the death of George Campbell more than a year ago, was elected president of the company at a board meeting in Boston, April 21. At the same time the appointment of F. A. Tracy as manager was confirmed.

Lemmon is a native of the California Mother Lode section, having been born in Sierra Valley in 1873. His introduction to business was via the printing trade, which led to an early newspaper career. His first connection with the utility business was in 1906 when he became Nevada representative for the late Frank G. Baum, hydroelectric engineer. Later he became agent for one of the predecessor companies of Sierra Pacific and remained with that organization until its purchase by Stone & Webster.

In 1919 he want to Halifax as sales manager of the utility there. In 1920 he became personnel manager of all Stone & Webster utilities, a position he held for 11 years when he was forced to retire because of ill health. A short time later he returned to Reno as sales manager of Sierra Pacific. He was elected vice-president three years ago.

● RAY C. WAKEFIELD, member of the California Railroad Commission, has been named to the post of Federal Communication Commissioner by President Roosevelt. A former Fresno, Calif., attorney, Wakefield has been a member of the California Commission since 1937. He served one year as president. In addition he is a vice president of the National Association of Railway and Utility Commissioners. No successor has as yet been named to fill his term on the California Commission which has two years to run.

● CLARK BAKER, No. Calif. Electrical Bureau's lighting counselor, has been called in for suggestions on the relighting of a school for the blind! (Even a school for the blind needs proper lighting, as all the children are not totally blind, and besides, what about the poor teachers?) So great is the interest in fluorescent lighting that Baker has designed a new course under Bureau sponsorship to cover proper handling of this light source on particular applications. One session will be devoted to the important subjects of auxiliaries, starters and maintenance.

● L. Dean Pulsifer, formerly of the San Francisco office of Westinghouse Electric & Mfg. Co., as supervisor of refrigeration sales, was transferred to Seattle to work in the same capacity.

BIG NEWS!

O-B Adds Four More Features to Improve Bushing Performance

Sectioned Class L-20, 34.5-kv. bushing, and a Class G-30, 69-kv. unit . . . 1—Sealed oil expansion chamber; 2—Magnetic oil level gauge; 3—Internal porcelain barriers; 4—Upper terminal.

1 COMPLETE SEALING

New oil expansion chamber *on all sizes* prevents breathing of moisture-laden air which might reduce insulating value of oil . . Maintains electrical stability, the sealing being permanent . . Permits bushings to be stored or handled in any position without oil loss . . Eliminates need for adding oil at any time.

2 MAGNETIC OIL GAUGE

Provides oil level indicator for all Class G bushings which can be read easily from considerable distance . . Maintains readability since oil cannot reach and discolor the dial . . Eliminates possible gauge glass oil leaks.

3 MORE INTERNAL PORCELAIN

Improves over-all electrical efficiency . . Adds to the dielectric stability since porcelain is unaffected by temperature, condition of oil, electrical stress or time . . Increases safety factor against puncture and internal over-surface stress . . Permits a better electrical grading, insuring absence of radio-disturbing corona.

4 INTERCHANGEABLE TERMINALS

Make each transformer bushing suitable for many terminal combinations, reducing number of bushings in stock . . Allow draw cable or fixed conductor connections to be made or rearranged without disturbing the oil seal.

Buy the Best ...Buy O-B

Ohio Brass (B)

MANSFIELD, OHIO, U. S. A. 2228-H

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario

TRADE
notes

GRAYBAR, O-B AGENCY

An emergency arrangement between Graybar Electric Co. and the Ohio Brass Co. became effective, on March 26, by which Graybar assumes the distribution of O-B low-voltage insulators and hardware for distribution and farm lines. In addition, Graybar handles the entire O-B insulator line for REA and municipal use.

● CAYGILL Co. have been appointed associate distributors in California for Premier Vacuum Cleaners, and will in addition continue to handle distribution of Blackstone Washers and Ironers. Mrs. Caygill will be in charge of the San Francisco office and showroom, and Caygill, who has been associated with the appliance industry for over 20 years, will be in charge of the Los Angeles showroom and office.

● NEW WESTINGHOUSE LAMP man in Salt Lake City is W. F. Fauber. Formerly located at San Francisco, he was associated during 1939-1940 with the Westinghouse exhibit at the Golden Gate exposition.

● MOTT ELECTRIC, LTD., Vancouver, B. C., has the contract for electric wiring installation in the new studios of CKWX, Vancouver. The Dominion Sound Equipments, Ltd., Vancouver, allied with the Northern Electric Co. will supply the acoustic materials, and Airpurator Company, Ltd., the air conditioning equipment.

● BEATTY BROS. who, for the past eight years, have been located at 91 Lonsdale avenue, North Vancouver, B. C., have now moved to their new quarters at 240 Lonsdale avenue. Expansion of business has necessitated the acquisition of more extensive store and showroom accommodation.

● A NEW APPLIANCE DEALER is the Washburn Service company at Orem, Utah. The Crosley appliance line will be handled exclusively. A. V. Washburn is manager.

● NEW KELVINATOR appliance dealers in Montrose, Colorado is the Modern Electric Company. The sales manager is Jerry Metz.

● JOHN MADDOX, northern California and western agent for Colonial Premiere Lamps, the Railley Corp., Chase Brass Lighting Fixtures, etc., moved from 639 Mission St. to Tilden Sales Bldg., 7 Front St. or 456 Market St., San Fransisco.

● J. C. MCGINLEY has been appointed western states representative for St. Charles Uni-Bilt kitchen cabinets with headquarters at 3100 Telegraph Ave., Oakland, and displays in Los Angeles, San Francisco and Oakland. Kitchen planning service for a wide variety of kitchen cabinet units possible of assembly in any combination will be made at Oakland.

● HOOVER vacuum cleaner salesmen from Utah gathered to hear executives M. R. Bradford, Utah district sales manager, J. K. Frazier, S. H. Gilliland, of North Canton, Ohio, and K. Q. Brown, Los Angeles, representatives of the Hoover company, discuss sales programs for the year.

● GEVURTZ FURNITURE CO., Portland, announced the opening of a newly enlarged appliance department early last month.

● REFRIGERATION started early in Arizona with a joint campaign by electrical dealers and utilities in February and March. A cooking school was used to stage an electric refrigerator exhibit and to tell the story of "how an electric refrigerator pays for itself."

● J. C. BIRD, manager of Electric Agencies, 207 1st Ave. So., Seattle, has been named representative of Spang-Chalfont, Inc., which recently took over Central Conduit Co. of Pittsburgh, Pa. He has also been named representative in Oregon and Washington for U. S. Rubber Co. and represents Bowers Manufacturing Co. of Los Angeles, manufacturer of outlet boxes; and Oliver Iron & Steel Corp., manufacturers of pole line hardware.

● TIMOTHY J. BURKE, formerly of Stubbs Electric Co., Portland, has moved to Seattle to become representative for National Electric Products Corp.

● FOR CHALKING UP the greatest number of sales of RCA radios from July 1, 1940 to Feb. 1, 1941, Lyle Butters, Boyle Furniture Co., Ogden, Utah, was awarded a first prize of $300.00 by the Salt Lake Hardware Co.

● WESTERN AUTO SUPPLY CO., Ogden, Utah, has recently enlarged its appliance department. Geo. O'Keefe is manager.

● WALLY BARNES of Electric Agencies, 1561 Russ Bldg., San Francisco, manufacturers' representative, is now representing Circle Wire & Cable Corp., New York, for northern California and Nevada.

● PACIFIC ELECTRICAL AND MECHANICAL CO., electrical contractors, has added to its staff Matthew J. Sisich as lighting engineer and salesman, formerly of the lighting staff of PG and E Co., San Francisco. He will contact commercial and industrial prospects in all of northern California, developing improved lighting and engineering it. Sisich is secretary of the Bay Cities section of I.E.S.

CONTRACTS

TO BARD LAGUNA ELECTRIC COOPERATIVE, INC., Bard, Calif., $25,000 to build 26 miles of line to serve 76 members in Imperial County.

TO BIG HORN COUNTY ELECTRIC COOPERATIVE, INC., Hardin, Montana, $20,000 to complete system. Borrower previously allotted $188,000 to build 157 miles of line to serve 492 members in Big Horn County, and $5,000 to finance house wiring and plumbing installation.

TO WASCO ELECTRIC COOPERATIVE, INC., $10,000 to complete system. Previous allotment $240,000 for 264 miles of line.

PUD NO. 1, COWLITZ COUNTY, Longview, Washington, was allotted $10,000 to complete system. Previous: $211,000 for 166 miles of line.

TO E. T. ARCHER & CO., $100,000 to build 300 mi. of line for Sand Hill Rural Electric Cooperative, Albuquerque, N. M., an REA project.

PLUMAS-SIERRA RURAL ELECTRIC COOPERATIVE, Portola, Calif., $20,000 to complete system. $328,000 previous to build 245 mi. of line.

TO T. E. CONNOLLY CO., San Francisco, $6,000,000 to build Cresta and Pulga pressure tunnels and surge chambers, appurtenances, North Fork Feather River, for PG&E.

TO COOPER-BESSEMER CORP., $75,816 for Puget Sound Navy Yard, Bremerton, auxiliary electric generating equipment.

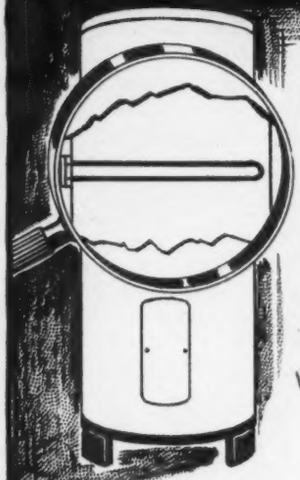
TO CAHILL-MOONEY CONSTRUCTION CO., Butte, Montana. $129,966 for 179 mi. of line for Fergus Electric Cooperative, Inc., Lewistown, Montana. An REA project.

TO STOVALL CONSTRUCTION CO., Oklahoma City, Oklahoma, $63,163 for 121 mi. of line for Roosevelt County Electric Cooperative, Inc., Portales, N. M. An REA project.

TO RAYMOND ELECTRIC CO. of Tacoma, submitted the low bid of $3240 to State Director of Finance Olaf L. Olsen, at Olympia, for the electrical work in the laundry building and additions at the Western State Hospital at Fort Steilacoom, Wash.

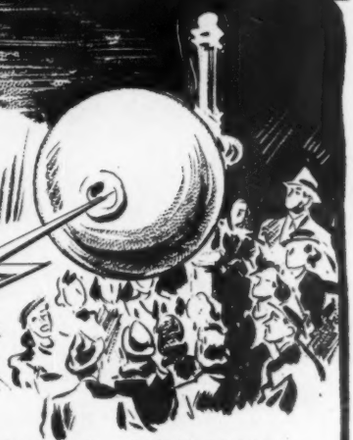
TO LUCAS ELECTRIC COMPANY, Vancouver, B. C., awarded subcontract for electrical installation in new $50,000 apartment building now under construction at Vancouver.

WOULD YOU BELIEVE IT?



MAXIMUM RETURN

EVERY DOLLAR SPENT FOR ELECTRICITY IS INSURED BY THE HOTPOINT CALROD HEATING UNIT IMMERSED DIRECTLY IN THE WATER—PURE ELECTRIC HEAT IS RELEASED FROM IMMERSED UNITS WITHOUT WASTE!

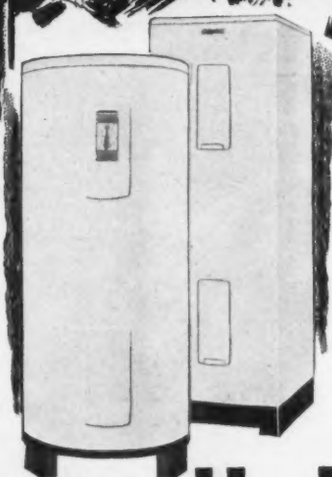


MAN-MADE LIGHTNING

SEVERAL THOUSAND VOLTS HAS BEEN USED TO TEST THE NON-CONDUCTING PROPERTIES OF CALROD'S EXCLUSIVE "SAFE-T-SEAL". IT PASSED THE TEST WITH FLYING COLORS - PROVING IT'S ABILITY TO DELIVER LONG, TROUBLE-FREE SERVICE!

1941 1940 WAS BIGGEST YEAR

IN ELECTRIC WATER HEATER HISTORY, AND HOTPOINT OUTSOLD ALL OTHER MAKES! NEW HOME BUILDING AND MODERNIZING ARE STILL SKYROCKETING—PROMISING AN EVEN GREATER MARKET THIS YEAR!



HOTPOINT Electric Water Heaters outsell all others because: 1. Hotpoint is the best-known and most complete line in the industry. 2. It is backed by a powerful trade paper advertising campaign reaching builders—men who account for 70% of water heater sales. 3. Homeowners read the Hotpoint Water Heater story in national magazines. To help clinch all these sales Hotpoint gives you tested, sure-fire sales promotion helps. Edison General Electric Appliance Co., Inc., 5612 W. Taylor St., Chicago.

AUTOMATIC ELECTRIC **Hotpoint** WATER HEATERS

Electric Ranges • Refrigerators • Washers and Ironers • Clothes Dryers • Automatic Dishwashers • Electrasink

Edison General Electric Appliance Co., Inc.
5612 West Taylor Street, Chicago, Illinois

Please send me full information on the complete line of Hotpoint Automatic Electric Water Heaters.

*Name*_____

*Address*_____

*City*_____ *State*_____

Look Out Your Own Window

SEE THE HARVEST OF PROFITS . . .
YOURS IF YOU'LL JUST TELL PEOPLE ABOUT

General Electric *AUTOMATIC* Water Heaters

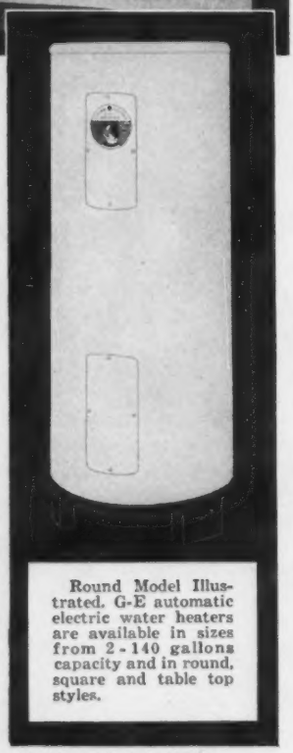
LOOK OUT NOW AND SEE THE MANY PLACES WHERE HOT WATER IS NEEDED!
EVERY ONE IS A PROSPECTIVE SALE FOR YOU!

There are profits for the picking—easy profits and plenty of them—right along "Main Street" and all around town. Just look out your own window and you'll see plenty of places that need a water heater. A water heater is the *one* major electric appliance which has both a domestic as well as a commercial market. There are at least 18 different places where an automatic electric water heater can be sold.

And a General Electric Water Heater is built to give the best and lowest-priced service in each and every one of these places. The famous G-E Calrod unit is immersed in the water for most efficient heating —automatic adjustable Thermostats give a constant supply of hot water—heavy mineral insulation holds the water at the desired temperature day and night.

Tell your General Electric water heater story to more people and you will be surprised at the *plus profits* you'll reap.

Send for your free copy of a new selling manual—telling 6 easy steps to convert prospects into sales. Send for yours today!



Round Model Illustrated. G-E automatic electric water heaters are available in sizes from 2 - 140 gallons capacity and in round, square and table top styles.

Write Today

FOR G-E's NEW
"ROUND-THE-TOWN"
MANUAL ON SELLING G-E
AUTOMATIC WATER HEATERS

GIVES 6 EASY STEPS FOR MAKING QUICK SALES

General Electric Co., Dept. P-175
Bridgeport, Conn.
Please send me without cost your new booklet on selling G-E Water Heaters.
Name.....
Street.....
City.....State.....

GENERAL ELECTRIC

ELECTRIQUIZ ANSWERS

(Quiz on p. 66)

1. False. An electric steam accumulator is a device for storing electric heat in water, to be turned into steam instantly when needed. The accumulator was designed for sterilizing milk handling equipment, but it is adaptable to other uses where small quantities of steam are required.

2. True. However, simple mathematics or demonstration make its effects easy to understand.

3. False. If you loaded 1600 ordinary bricks (five tons) from the ground to the bed of a truck four feet high, you would be doing about what a kilowatt-hour, purchasable for a few cents, would do.

4. False. Although an electric water heater supplies hot water at any time, its heating element operates only about one-fourth of the time in the average home.

5. False. A three-way switch provides control from two points.

6. False. The temperature marking means temperature rise above room or ambient temperature. If the temperature of a room is 40 deg. C., the temperature of the motor under full load will not be in excess of 80 deg. C.

7. True. Since the heating element in an electric water heater is immersed in the water, all of the electrical energy is delivered to the water. In the other types of appliances mentioned, it is not yet possible to make so complete a transformation of energy from one form to another and deliver it so completely to the product.

8. False. The "electric pig" is the popular name of the electric garbage disposal unit.

9. False. In a recent address before a joint session of AIEE and IES, A. H. Crowl of the FBI listed adequate illumination of industrial plants as a first line of protection against espionage and sabotage.

10. True. Bulb snatching is a crime against good lighting and eyesight protection.

J. A. Corlett, G-E Co., Los Angeles, and M. W. Phillips, So. Calif. Edison Co., Visalia, are the authors of this month's Electriquiz.

"WHO AM I?"

Answer to "Who Am I?" (see p. 68) Asher Earl "Doc" Holloway.

TORK CLOCKS

THE POPULAR TIME SWITCH LINE KNOWN EVERYWHERE

NOW—lower prices and higher capacities

There is a Tork Clock for every regular switching job; 60 minute, 4 hour or daily cycles.

Bulletins on request

THE TORK CLOCK CO., Inc.
MOUNT VERNON, N. Y.

Western Representatives:
A. R. Slimmon, 445 E. 3rd St., Los Angeles
Geo. H. Curtiss, 540 McAllister St., S. F.
H. M. Sayers, 1019 Eastlake Ave., Seattle
Stevens Sales Co., 41 P.O. Place, Salt Lake City
Felix Simon, P. O. Box 614 . . . . . Denver
H. Geo. Shefler, P. O. Box 1587 . . . Phoenix

SMOOT-HOLMAN COMPANY

Pioneers of Lighting in the West

LUMINAIRES
REFLECTORS

SMOOT-HOLMAN COMPANY
SIGHT-CRAFT
INGLEWOOD CALIFORNIA

FLUORESCENTS
FLOODLIGHTS

INDUSTRIAL AND COMMERCIAL LIGHTING EQUIPMENT

HOME OFFICE AND FACTORY . . . INGLEWOOD, CALIFORNIA

WAREHOUSES

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460—7th St.

HOUSTON, TEXAS
315 Crawford Street

FRED ZAUGG
630 N.W. 10th Ave.,
Portland, Ore.

COAST SALES CO.
307 Main St.,
Seattle, Wash.

STEVENS SALES CO.
41 Post Office Place,
Salt Lake City, Utah

G. S. SPANGLER
618 Colorado Bldg.,
Denver, Colo.

HELWIG Company

QUALITY CARBON BRUSHES
for
MOTORS AND GENERATORS

Catalogs on request
Stocked at:

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Portland, Ore.
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Broadway 0471

Los Angeles, Calif.
225 W. Pico Blvd.
PRospect 2523

Seattle, Wash.
166 Jackson St.
Elliot 3582

G.C.A.

Lamp Replacers
Lamp Base Removers
Cartridge Fuse Tongs
Switch Hooks

Send for Catalogue
We have been making safety tools for 24 years

THE G. C. A. Manufacturing Co.
Pittsfield, Mass.

LEW FLOOR BOXES

Give You Greatest Flexibility in Floor Box Applications

A floor outlet for any type of floor construction.

LEW Floor Boxes and Fittings manufactured since 1930 are credited with being the finest made.

A TRIAL WILL CONVINCE YOU
Complete stock carried in Western Warehouse
CALL or WRITE

Walter E. Brand Co.
1855 Industrial St., Los Angeles, Calif.

Lew Fittings Co.
630 W. Jackson Blvd., Chicago, Ill.

"WHAT CAN IT DO FOR ME?"

Advertising that is read with this thought in mind, may provide the solution to a problem that has kept you awake nights.

We all know "It Pays To Advertise." It pays just as big to investigate WHAT IS ADVERTISED—every month in

ELECTRICAL WEST

TRADE MARK REG. U.S. PAT. OFF.

Nichrome

Made only by **DRIVER-HARRIS COMPANY**

Stocked for the Coast Trade at

SAN FRANCISCO
235-241 San Bruno Ave.

LOS ANGELES
449 South San Pedro St.

SEATTLE
2122 Fourth Ave.

By

ANGUS-CAMPBELL, INC.

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

2 East End Ave. New York

GEO. E. HONN CO.

420 Market St. San Francisco, Calif.

Manufacturers' Representative for

PYREX INSULATORS
S & C PROTECTIVE DEVICES
CORNELL-DUBILIER CAPACITORS
KELLEMS CABLE GRIPS
BLACKBURN CONNECTORS
COLUMBIA TONG TEST AMMETERS
—LOW VOLTAGE GENERATORS
BARTLETT TREE TRIMMING EQUIPMENT
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Roebling's Sons Co., John A. 84

Schweitzer & Conrad, Inc. 27, 28
Shell Oil Company 3
Smoot-Holman Co. 89
Southern California Edison Co., Ltd. ..... 2nd Cover
Square D Company 77

Tork Clock Co., Inc. 89
Trico Fuse Mfg. Co. 13

Union Carbide & Carbon Corp. 22
Union Oil Co. of California 78
Utah Power & Light Co. 54, 55

Victor Insulators, Inc. 15

Washington Water Power Co. 54, 55
Westinghouse Elec. & Mfg. Co.
East Pittsburgh 73, 74

PROFILES *of the month*

At an Easy dealer meeting in San Francisco were Frank Acardi, Nathan Dohrmann, San Jose, Wally Lang, Breuner Co., Sacramento, H. A. Hilmer, Dohrmann Commercial, San Francisco, and Lester Fisher, Sacramento

Carl Snyder (below) new business agent for the Los Angeles Bureau of Power & Light will direct sales promotion activities. He has been with the organization since 1923, having started in the engineering department

For 25 years D. E. Harris, General Electric Supply Corp. vice-president, has tried to catch a salmon in the Northwest. He did

W. J. Bray, Jennings Furniture Co., and J. W. Bremmer, Northwestern Electric Co., Portland, receive winning window display checks from A. C. McMicken, MKB Northwest area director

Preview of coming campaigns by

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

and the Electric Appliance Society

COMMANDS MORE SERVANTS THAN ALADDIN'S LAMP!

ELECTRIC APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

Beginning May 26

TWO WEEKS OF INTENSIVE GIFT MERCHANDISING

MAY 26 to JUNE 7

Remembering that June is a season of gift giving second only to Christmas, the Electric Appliance Society is planning another campaign to glorify the **electrical** gift.

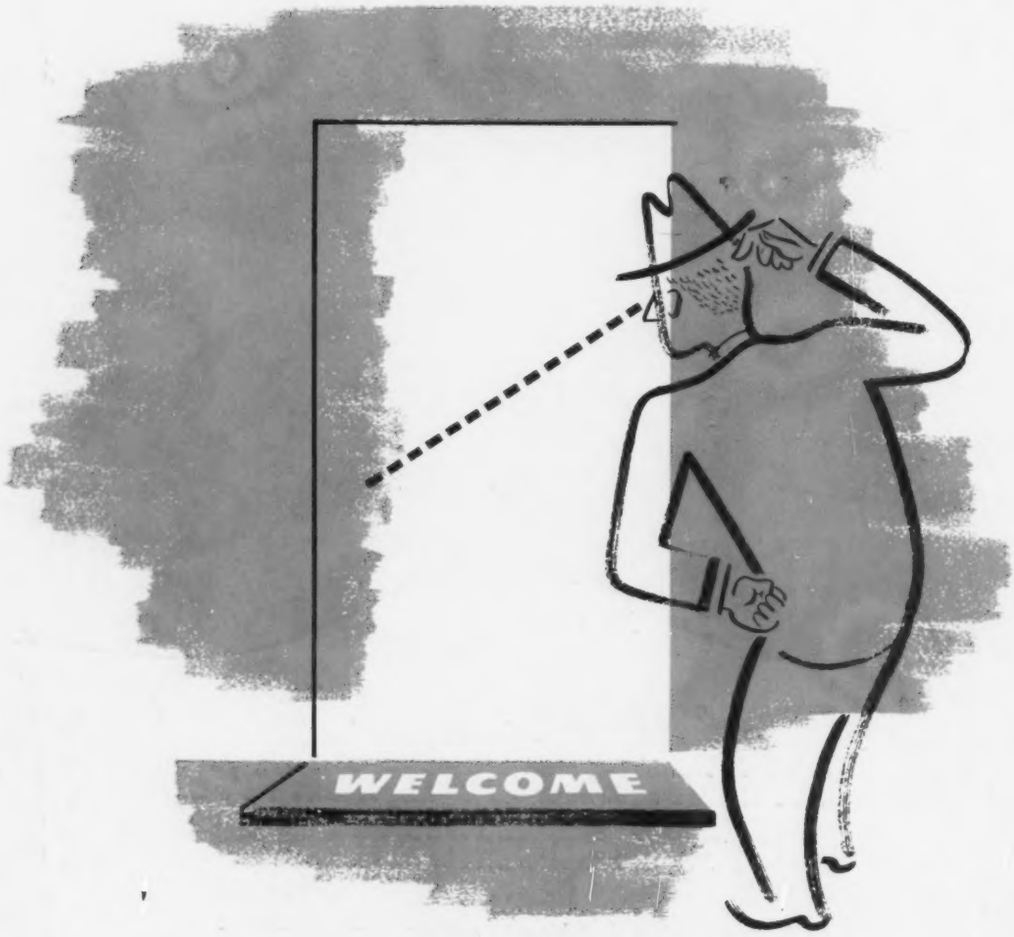
It will be pointed out that for weddings, graduations, housewarmings and anniversaries, nothing is more acceptable these days than a beautiful and USEFUL electric appliance.

Major medium will be window displays, but there will be plenty of publicity too, including two big **newspaper** advertisements.

Details are being worked out now and will probably be in the mail within a few days.

EW 105-541

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Electric Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Electric Appliance Society, 1355 Market St., San Francisco, Calif.



LIKE A DOOR WITHOUT A KNOB

Adequate wiring is the knob that opens the door to maximum sales of electrical appliances and fixtures by the entire electrical industry. It provides ample facilities for the convenient use of modern electrical servants both now and in the future. Adequate wiring is the backbone of our business. It increases the effectiveness of all our selling activities. Make it **your** business to promote adequate wiring in every way you can. Write for free promotional material and information about starting an adequate wiring campaign in your locality.

PACIFIC COAST ELECTRICAL BUREAU

601 WEST 5TH STREET LOS ANGELES • 447 SUTTER STREET, SAN FRANCISCO

CERTIFIED ADEQUATE RED SEAL STANDARD WIRING

5-41